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TELEPHONE and Management ENGINEER

MARCH
1956

vol 60
#3.

THE NATIONAL TELEPHONE MAGAZINE

Featuring in This Issue—

- ★ MICROWAVE AT WORK IN THE PHILIPPINES, *by H. E. Pratte*
- ★ THE INDEPENDENTS & NATIONWIDE TOLL DIALING, *by L. A. Hodson*
- ★ DIAL COMES TO TOWN, *by Ruth E. Richards*
- ★ DETACHED CONTACT CIRCUIT DIAGRAMS, *by R. G. Tungate*
- ★ MODERN CABLE CONSTRUCTION, *by John S. Reed*

Since 1910, more and more Telephone Companies have turned to L. M. Berry and Company to handle their Directory Advertising. As a result, Berry men today are successfully handling more than 950 directories for over 250 Independent and Bell Telephone Companies in 29 different states.

We would welcome an opportunity to handle your directory. Call or write today for details.

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L. M. BERRY AND CO.

General Offices • Hulman Building • Dayton 2, Ohio • Michigan 7421

Telephone Directory Advertising Exclusively

DESIGNED FOR THE FUTURE

TELECABLE®

EXCHANGE AREA CABLE

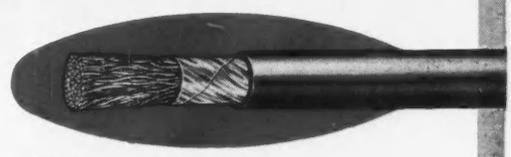
EFFECTS ECONOMIES TODAY!

Your needs today, when correctly interpreted and properly met, mean tremendous savings in the future.

TELECABLE Exchange Area Cable meets today's needs and, as manufactured under Whitney Blake high standards of quality, promises to favorably affect the future economy of the Independent Telephone Industry as greatly as WB TELEPRENE® neoprene jacketed drop wire has in the past ten years.

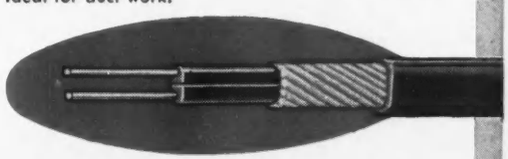
Only products of the highest quality can effect such economies — and the Whitney Blake reputation for top quality products is known throughout the industry.

TELECABLE Exchange Area Cable is available in #24, #22, and #19 AWG, in 11, 16, 26, 51, 76, 101, 152 and 202 pair. It has polyethylene insulation, polyethylene tape over cabled pairs, an aluminum shield and black weather-resistant polyethylene jacket.



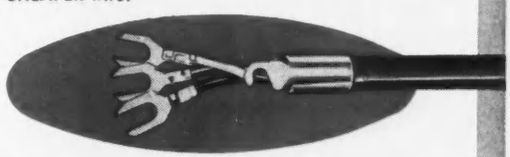
TELECABLE Inside Wiring Cable

TELECABLE INSIDE WIRING CABLE has semi-rigid Plastite® insulation and brown or ivory Plastite jacket. Light in weight. Water resistant. Excellent electrical characteristics. Unaffected by humidity. Ideal for duct work.



TELEPRENE® Neoprene Jacketed Drop Wire

Famous WB long life drop wire has demonstrated that a BETTER wire is much more economical than a CHEAPER wire.



TELECORD® Neoprene Jacketed Telephone Cord

This sturdy, long-lasting telephone cord resists abrasion, perspiration, humidity, oil and grease. Specify TELECORD on new telephones and on replacements for economy and service.

INDEPENDENT

Well Built Wires Since 1899

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WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT

COMPLETE REPAIR DEPARTMENT – EQUIPPED TO REPAIR ALL SPINNERS

COMPLETE "PARTS" DEPARTMENT

Parts shipped from stock same day for field repairs

CABLE SPINNING EQUIPMENT CO.

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TOPEKA KANSAS

Phone 2-7234

OVERSEAS SALES:

Ericsson Telephone Sales Corp. of New York

Automatic Electric of Canada

Pirelli of Great Britain

TELEPHONE and Management ENGINEER

Telephone Engineer Publication

MARCH 1956

Vol. 60 No. 3

The National Telephone Magazine

Editor, RAY W. SMITH • *Advertising Director,* ROY F. SMITH

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Washington Bureau, Editors of "Telecommunications Reports"

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Circulation Manager, PAT LAWHORN

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FRONT COVER

ROBERT E. WILLIAMS, of Chicago, Ill., an executive of the Automatic Electric Co., is pictured being sworn in as Director of the Communications Division, Business and Defense Services Administration, U. S. Department of Commerce. Administering the oath of office is BDSA Administrator CHARLES F. HONEYWELL. (—For complete story see page 79.)

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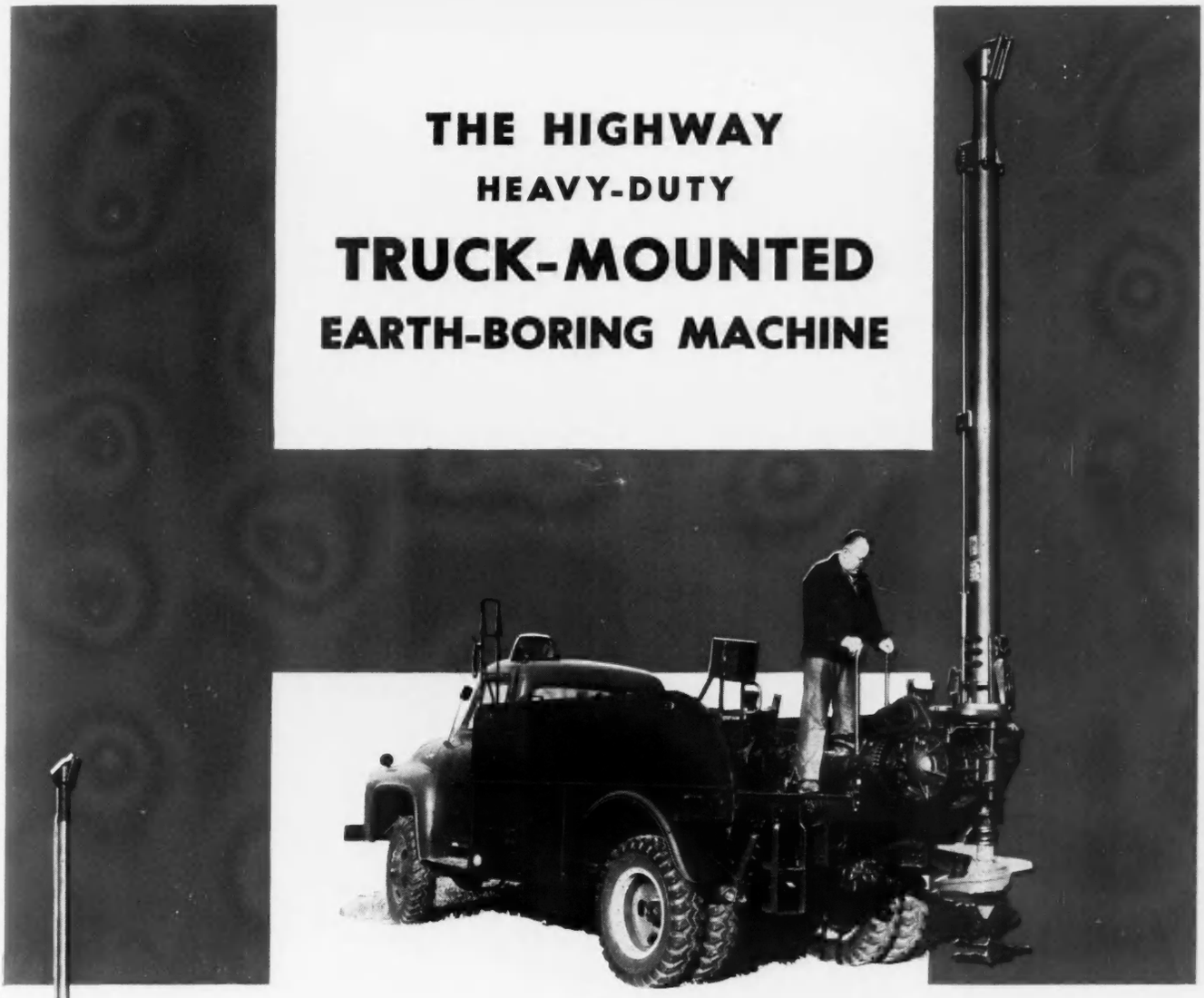
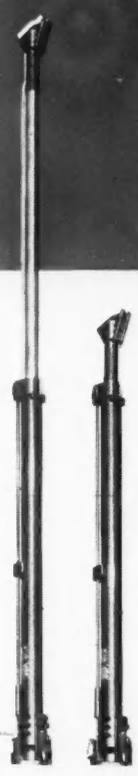
THE HIGHWAY
HEAVY-DUTY
TRUCK-MOUNTED
EARTH-BORING MACHINE





Exclusive!

Highway's Telescoping Derrick

The telescoping derrick, 3500-lb capacity, can be extended to more than one-half its collapsed length. Available as optional equipment on the Model "HC" machine.

Modern . . . Rugged . . . Versatile . . . Efficient . . .

digs at any angle up to 90° in *any* soil condition — even rock when equipped with special auger . . . convenient controls . . . sets big poles

The Highway "HC" earth-boring machine is designed and built rugged and sturdy, for tough daily use. The power-operated "HC" can be quickly adjusted to dig at any angle up to 90° — auger bar and pole derrick raised from traveling to working positions by power. Light enough for mounting on a minimum 16,000-pound G. V. W. truck, the "HC" digger requires only 7 square feet of platform space. Convenient controls are easily accessible and Highway design provides complete safety for both operator and machine.

The "HC" earth borer digs holes from 9 to 36 inches in diameter, up to 10 feet deep. A 2500-lb. capacity winch and pole derrick (optional equipment) can handle 40′ to 45′ poles.

HIGHWAY TRAILERS

HIGHWAY UTILITY DIVISION

HIGHWAY TRAILER COMPANY

HEADQUARTERS: EDGERTON, WISCONSIN

Manufacturers of

Public Utility Bodies • Earth-Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-offs • Service Accessories • Commercial Trailers • Trailerized Tanks and Dry Bulk Haulers

SALES AND SERVICE IN PRINCIPAL CITIES

(chinese red,

antique ivory,

canary yellow,

chestnut brown,

olive green,

desert beige,

french blue,

dove gray)

Gay co

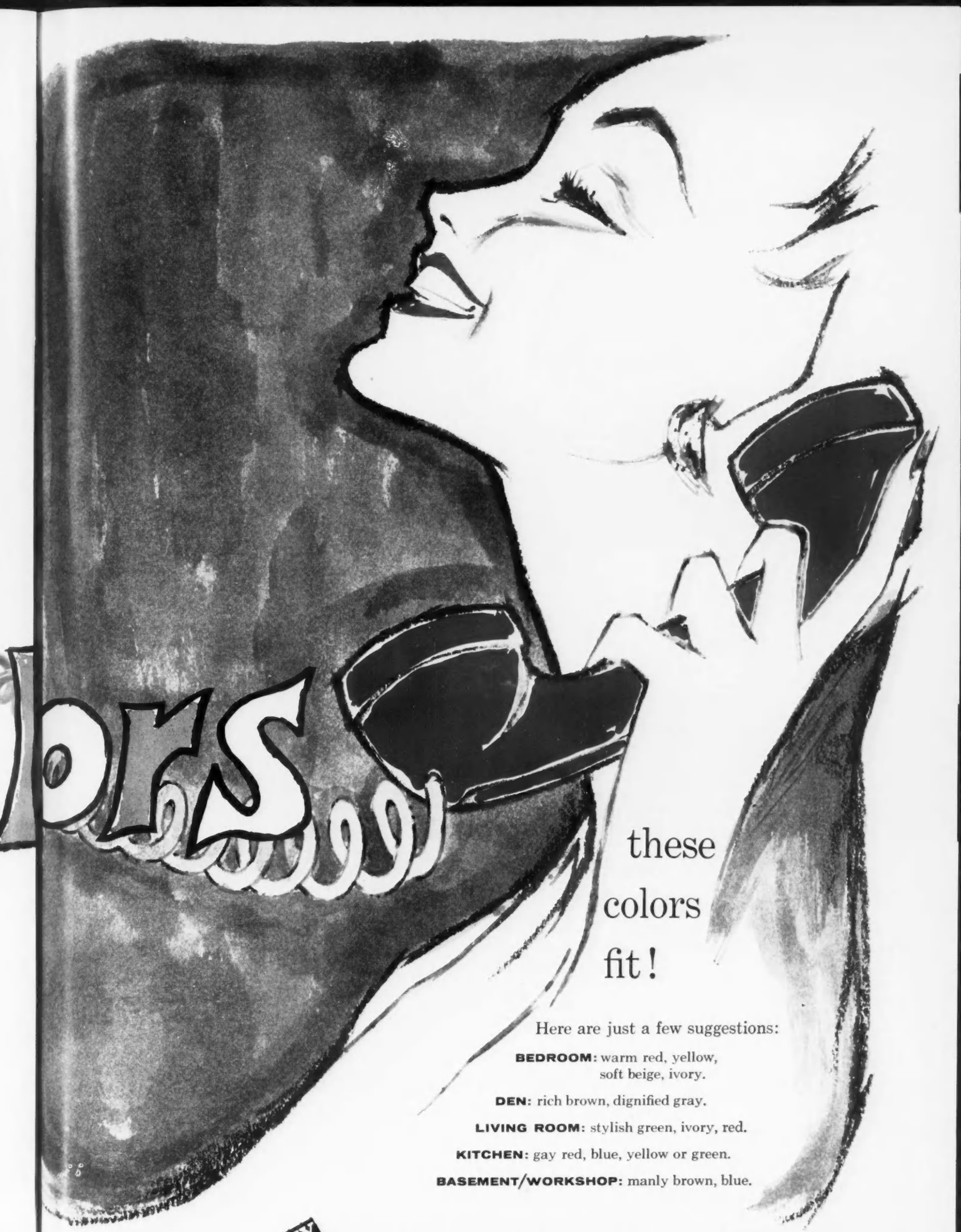
and two-way mounting

(Stromberg-Carlson color telephones can be either table- or wall-mounted—change over easily in a matter of minutes)

can help you promote that second phone!

(subscribers *love* extensions that blend well with their home's color scheme and can be installed right where they need them!)

Call your Stromberg-Carlson branch office for sales helps and prices.



these colors fit!

Here are just a few suggestions:

BEDROOM: warm red, yellow, soft beige, ivory.

DEN: rich brown, dignified gray.

LIVING ROOM: stylish green, ivory, red.

KITCHEN: gay red, blue, yellow or green.

BASEMENT/WORKSHOP: manly brown, blue.

STROMBERG-CARLSON COMPANY

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 3, Chicago 6, Kansas City 8, Rochester 3, San Francisco 3.

KELLOGG SALUTES T

Kellogg's newest warehouse
at 1594 Southland Circle, N.W.
Atlanta, Georgia

New Modern Atlanta W

PROGRAM OF EVENTS

- Interesting speeches
- Continuous demonstration on Kellogg equipment and supply materials
- Buffet luncheons and dinners both days
- Door prizes and music for your entertainment

Come prepared to spend one or two very interesting and informative days with Kellogg.

THE GREAT SOUTHEAST

R. H. Smythe, Manager
Southeastern Division

R. A. Scarlata
Branch Office Manager

a Warehouse Now Open

Now, in addition to the 6 major Kellogg warehouses and more than 100 supplier distribution points which serve you throughout the Nation, Kellogg proudly announces the opening of its ultra-modern Atlanta Warehouse.

Kellogg takes this opportunity to salute the great Southeast. We are proud to be citizens of this territory and of the State of Georgia. We welcome this chance to be of greater service to the independent telephone industry.

KELLOGG
A DIVISION OF I T & T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
A Division of International Telephone and Telegraph Corporation
Sales Offices: 79 W. Monroe St., Chicago 3, Ill.

KELLOGG Branch Warehouses and Offices:

6000 W. 51st Street
Chicago 38, Illinois
REliance 5-5445

4501 Truman Road
Kansas City 1, Missouri
Humboldt 7085

410 N. Syndicate Avenue
St. Paul 4, Minnesota
Nestor 5878

1515 Turtle Creek Blvd.
Dallas 2, Texas
Prospect 5191

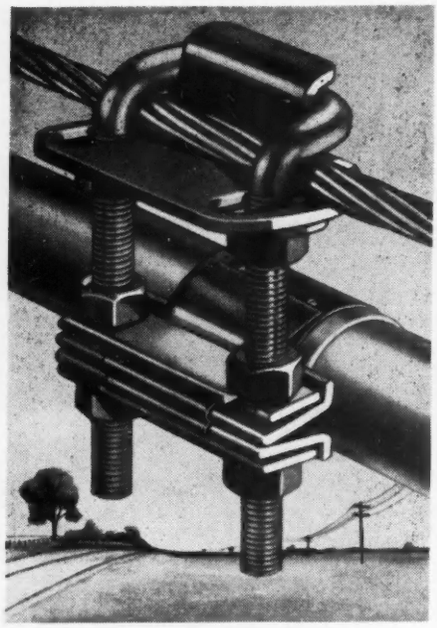
1663 Mission Street
San Francisco 3, California
Market 1-6011

1555 West Fourth Street
Mansfield, Ohio
Mansfield 7-2816

KELLOGG Branch Office:
406 S. Main Street
Los Angeles 13, Calif.
Vandyke 6759

Export Distributor:
International Standard
Electric Corp.
50 Church Street
New York 7, N. Y.

***and now...*1594 Southland Circle, N.W.**
Atlanta, Georgia
Sycamore 4-2441



For Non-Slip Grip on Steep Grades depend on

KEARNEY

GRADE CLAMPS

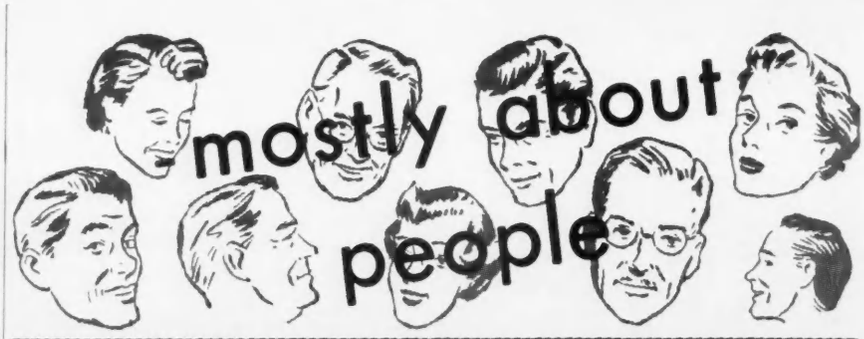
To hold aerial cable on grades or corners, you can be sure of a permanent, non-slip grip when your crews use KEARNEY Grade Clamps. And with this tight grip there is absolutely no danger of damage to the cable. A wide steel band binds it to the clamp. You can re-use the clamp again and again, simply by inserting a new length of band. No matter what size of cable is used, the correct spacing between cable and messenger is always maintained. Double-length Grade Clamps are available for clamping two cables to a single strand.

For Better Construction . . . Safer Maintenance

Specify 267

KEARNEY PRODUCTS

4224-42 Clayton Ave. • St. Louis 10, Mo.
Canadian Plant: Guelph, Ontario



ACROSS THE EDITOR'S DESK

Washington Luncheon

A LUNCHEON honoring *Frank Holeman*, Washington correspondent of the *New York Daily News*, recently inaugurated president of the National Press Club, and *Lucian C. Warren* of the *Buffalo (N. Y.) Courier-Express*, retiring president, was given recently (Feb. 15) by *Leon F. Roberts*, director of information of U-S-I-T-A, in one of the club's private dining rooms. Others present included *Roland C. Davies*, editor of *Telecommunications Report* and Washington editor of *Telephone Engineer Publications; Francis X. Welch*, editor of *Public Utilities Fortnightly* and Washington editor of *Telephony; Frank Fortune*, correspondent of the *Buffalo (N. Y.) Evening News;* and *James Ellis*, publication manager of the National Automobile Manufacturers Association.

Last month Jamestown (N. Y.) newspapers carried a story regarding the presentation of the late *Bainbridge Colby's* papers to the library of Congress, illustrated by a news photo of *Mr. Roberts* posing with *Robert H. Land*, assistant chief of Manuscripts Division of the Library, and inspecting the treasured historical documents.

The caption of the photograph read: "Former Jamestown (N.Y.) Mayor looks over the Bainbridge Colby papers at the Library of Congress."

In his younger days as a newspaperman, Mr. Roberts occasionally interviewed Mr. Colby for the press. Later, as Jamestown's Chief Executive, Roberts was called upon to welcome the former Secretary of State to the city, and still later, as commercial manager of the Jamestown Telephone Corporation he serviced the Colby family's telephone needs.

New Editor

"ALBERTA CALLS," the magazine for the employes of the Alberta (Can.) Government Telephones, introduced their new Editor *K. F. Wright* in its February issue. Mr. Wright is a member of the Personnel Manager's staff and will be responsible for the publication of their magazine as well for the duties in the public relations and allied fields.

■ ■ ■

Robert F. Nale

ROBERT F. NALE, purchasing agent for the California Interstate Telephone Co., was featured as Personality of the Month in the February CITCO Communicator. Bob Nale received his 20-year pin in 1954. The article also tells us that Bob is Supervisor of Materials and Supplies, in charge of Company Transportation as well as Purchasing Agent. In addition to these many duties Bob has challenged any one in his district to a golf game. Any one of these four seems to be quite an accomplishment.

■ ■ ■

Fiber-Glass Poles

ON MARCH 19 this writer will journey to Alma, Mich., where we will be the guests of the Consumers Power Co. to see a demonstration of Fiber-Glass Poles & Crossarms. We are indebted to the Line Material Company of Milwaukee for the opportunity of seeing this new development. You will read our report in a coming issue.

■ ■ ■

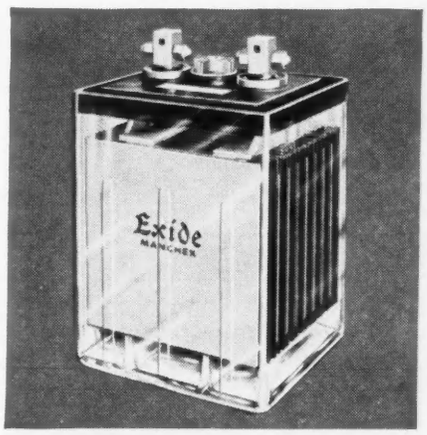
L. A. Hodson

IN THIS ISSUE, L. A. Hodson ends his series of articles on "The Independent Telephone Company and Nationwide Toll Dialing." We want to thank the many readers who have told us how valuable this series has been to them. In the April issue, Mr. Hodson will start another series on Direct Distant Dialing.

EXIDE-MANCHEX BATTERIES

Continuous and emergency power for telephone systems

Reserve lead supply in spiral buttons keeps battery young



TELEPHONE BATTERY. Exide-Manchex Batteries are available in a wide range of capacities from 8 to 960 ampere hours. Compact construction saves space and weight. Flat cover easy to clean. Write for Bulletin No. 4852.

Long after most other types of batteries turn up their toes and die, Exide-Manchex Batteries used in floating service applications are still going strong. And they keep on going strong for years and years.

The reason can be found in their unique construction. Exide engineers have cut through the center of an Exide-Manchex positive plate and photographed the results shown above. Under the outer layer of active material on the spiral buttons you can see a shiny core of reserve lead. During the life of the battery, this lead turns slowly to active material as it is needed. Yet the inactive metal grid never, never weakens; always retains its shape; holds the buttons firmly in place. Hence battery life is prolonged.

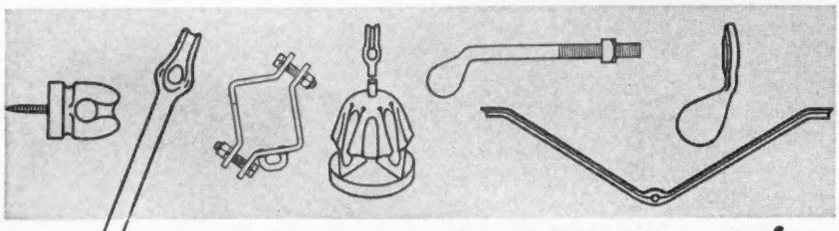
Only Exide-Manchex Batteries offer this extra assurance of long battery life. When you order batteries for floating service applications—whether with new equipment or for replacement—be sure to specify Exide-Manchex. For information, call the Exide sales office near you. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®

"Now you can look to Chance for pole line hardware too"

"The Seyler Manufacturing Company of Pittsburgh is now the A. B. Chance Company. This means that Chance engineering facilities will be used for the development of new pole line hardware items,"

says JACK CURTRIGHT, Sales Manager, Electrical Wholesale Products.



Send for your FREE COPY of this condensed Chance Catalog!

CHANCE (SEYLER) POLE LINE HARDWARE
A·B·CHANCE CO·
CONDENSED CATALOG
of POLE LINE HARDWARE and GUYING MATERIAL
CHANCE ANCHORS and GUYING MATERIAL

Here's a find-it-quick reference for everything you need in pole line hardware and guying material. Actually, it's a combination catalog and file folder. You'll like the way information is arranged to help you find what you want quickly and easily.

A·B·CHANCE CO·

CENTRALIA, MO., San Francisco, Cal., Pittsburgh, Pa.

Please send me the Chance condensed Catalog of Pole Line Hardware and Guying Material.

NAME_____

COMPANY_____

ADDRESS_____

CITY & STATE_____

ABC INDUSTRIES

CP56-7A

coming CONVENTIONS

OHIO:—Deshler-Hilton Hotel, Columbus, March 27-28.

NEBRASKA: — Paxton Hotel, Omaha, April 3 and 4

IOWA:-Hotel Fort Des Moines, Des Moines, April 10-11.

NORTH DAKOTA: — Gardner Hotel, Fargo, April 24-25.

INDIANA: — Claypool Hotel, Indianapolis, May 9-10.

ILLINOIS:—Hotel Pere Marquette, Peoria, May 16-17.

WISCONSIN: Lorraine Hotel, Madison, May 23-24.

PENNSYLVANIA: — Bedford Springs Hotel, Bedford, May 22 and 23.

WASHINGTON-OREGON: Hotel Multnomah, Portland, Ore., May 31, June 1-2.

KANSAS-MISSOURI: — Hotel Muehlebach, Kansas City, Mo., June 4 and 5.

CALIFORNIA: — Fairmont Hotel, San Francisco, June 6, 7 and 8.

NEW YORK:—Scaroon Manor Hotel, Schroon Lake, June 11, 12 and 13.

MICHIGAN: — Pantlind Hotel, Grand Rapids, Sept. 16 and 17.

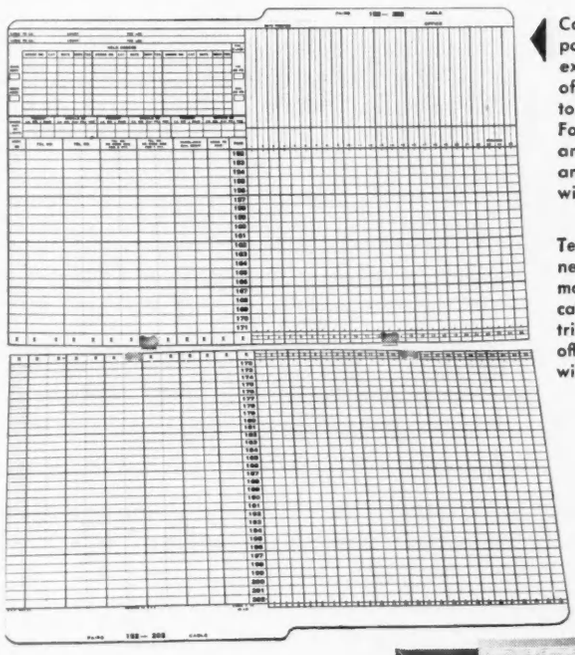
ARKANSAS:—Arlington Hotel, Hot Springs, Sept. 17-18.

ACME VISIBLE

CABLE AND TERMINAL ASSIGNMENTS

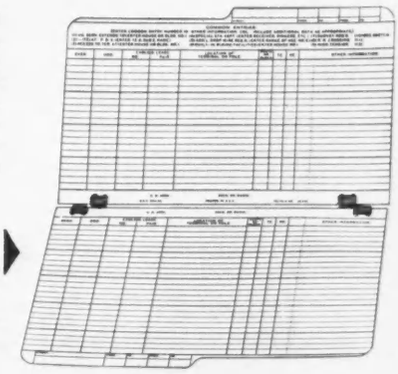
Designed by experienced telephone personnel to accommodate all of the various conditions encountered in the preparation of terminal assignment, exchange subscriber cable, and related basic plant records, in accordance with approved system practices.

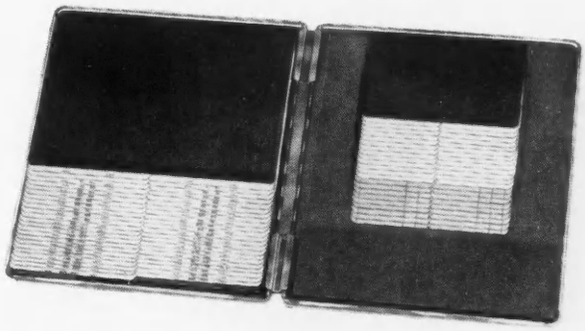
Simplifies and speeds the work of assignment. Adaptable for large, intermediate and small centers with the flexibility to meet the requirements for peak and normal work loads, varying number of cables, and other local conditions.



Cable assignment forms. With preprinted pair numbers, filed in numerical sequence, exposing a 51 pair complement. Cards are of special Acme Endurex rag content stock to permit repeated erasures and changes. Forms available for 50 terminal capacity and 8 party stations; 44 terminal capacity and 10 party stations; and for rural areas with more party lines.

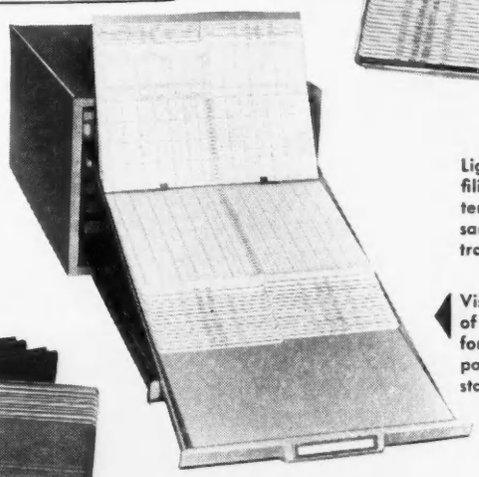
Terminal assignment forms. Eliminate the necessity of referring to supplementary maps to determine the correct distribution cable terminal. Forms available for distribution by (1) street, block or alley; (2) office building or apartment; (3) exchange wire.



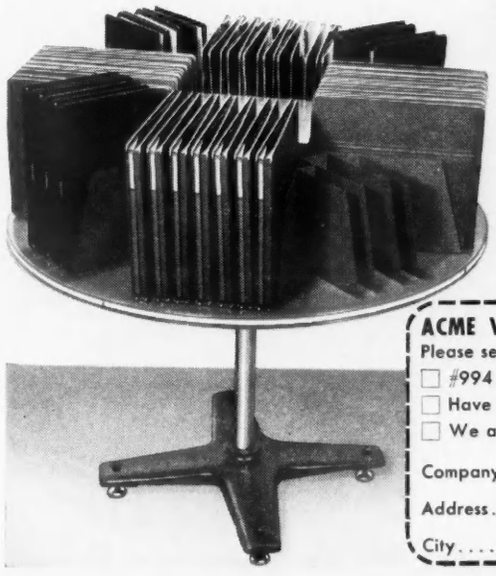


Light weight metal-edged visible books for filing of cable cards on one side and terminal cards on the other, or for the same card on both sides of the book. Attractive gray Keratol binding.

Rotary equipment available in various sizes with and without push button motor. Books slide in and out without any lifting. They provide accessability to records at many points around circumference, and permit clerk to do a complete cable throw.



Visible cabinets are available in a number of sizes. Each tray has a maximum of 102 forms or the equivalent of 5,100 cable pairs. Cabinets can be either stationary on stands or desks, or mounted on turntables.



ACME VISIBLE RECORDS, INC.

CROZET, VIRGINIA

ACME VISIBLE RECORDS, INC., Telephone System Division, Crozet, Virginia S356

Please send us illustrated booklet

☐ #994 on Acme Multi-Card Bulletin Holders ☐ #982 on Acme Flexoline for Telephone Companies

☐ Have representative call. Date..... Time.....

☐ We are interested in Acme Visible equipment for ..... records.
KIND OF RECORD

Company.....Attention.....

Address.....

City.....Zone.....State.....

"HI-FI" transmission with N

Subscriber satisfaction begins with the telephone instrument and, unhappily, frequently ends right there. The finer the telephone, the higher the subscriber satisfaction and loyalty.

Constant upgrading of living standards is heightening the demand for finer equipment.

In manufacturing the new "Hi-Fi" N-541, North anticipated these demands for efficiently modern

NORTH N-541 telephone ups subscriber satisfaction

telephones by providing "Hi-Fidelity" transmission quality second to none.

In designing the N-541 handpiece, North engineers have directed their efforts at perfecting voice transmission, at providing "Hi-Fi" telephone instruments.

The newly designed handpiece is fitted with the most modern transmitting and receiving units.

Both receiving and transmission unit cavities have been audio-tested to assure maximum efficiency of the units.

The N-541 telephone has an improved anti-side-tone circuit and a higher gain which provides clear natural transmission over long loops.

An automatic compensating network insures the same clear, well controlled level on short loop transmission.

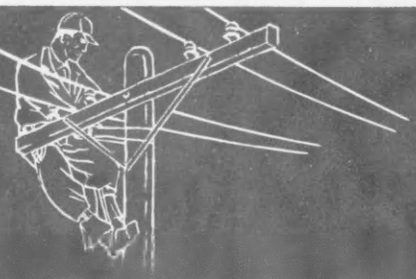
FOR COMPLETE SUBSCRIBER SATISFACTION STANDARDIZE NOW WITH

NORTH N-541 TELEPHONES

NORTH ELECTRIC COMPANY

655 SOUTH MARKET STREET • GALION, OHIO

Industry NEWSLETTER



- CWA Suggests Revision of Wage-Hour Forms.
- Phone Prize's Spark Kraft's Jingle Contest.
- U. S. Program Will Establish Executive Reserve Force.

FORM REVISION SUGGESTED

Stating that "recent changes in the Federal Minimum Wage Law as well as increased wage levels in the telephone industry" have made obsolete the present wage-hour schedule in forms by which Class A and B telephone companies make their annual reports to FCC, Communications Workers of America last month suggested a revision of the forms to the Commission. Effected would be a section of the form which shows the number of employes in each hourly wage bracket. CWA suggested replacement of four categories under $1. with a single "less than $1." bracket, and addition of categories at the other end so top would be "$2.90 and over" rather than present "$2.50 and over."

LENKURT PETITIONS FCC

Last month Lenkurt Electric Co. filed a petition seeking amendment of FCC's rules to control operation of industrial, scientific, and medical devices at 915 megacycles to prevent interference to communications services in the 890-940 mc bank, or alternatively for the reallocation of that band for common carrier fixed services on a primary basis. The filing is latest round in controversy between General Electric Co. and other industrial heating interests which are seeking to have 890-940 mc band finally marked for ISM operation, and the common carrier communications industry.

WISCONSIN TRADE

Wisconsin Tel. Co. requested Wisconsin commission approval of plan to trade its Shawano, Wisc., exchange to the Big Bend Tel. Co., in exchange for three smaller properties of the Big Bend firm. Shawano exchange is near properties of Urban Tel. Co., under same management as Big Bend company. Big Bend exchanges, serving about 1500 telephones, are near the Wisconsin company's Milwaukee and Waukesah service areas.

PLASTIC POLES

There may be a plastic telephone pole coming. Last month Gar Wood Industries, Inc., announced plans for production of a new fibrous glass telephone pole. Gar Wood has developed the plastic poles over the past year. It has applied for patents not only on the poles but also on the two machines it has invented to produce them. Consumers Power Co. set some of them up in northern Michigan on test basis last year. A few weeks ago some of them were shipped to Texas for a tryout. Also, Gar Wood is working "closely with American Tel. & Tel. engineers in New York," a Gar Wood representative said.

PERRINE HEADS NEW GROUP

George R. Perrine, chairman of the Illinois Commerce Commission was named president of the Great Lakes Association of Railroad & Utilities Commissioners, composed of commissions from eight states, at its organizational meeting in Chicago last month. Ohio Public Utilities Commissioner *Ralph A. Winter* was elected vice president and chairman of the group's Executive Committee.

PHONE PRIZES SPARK CONTEST

The unusual award of telephone service in their own name for one-year will be made to winners of a four-line jingle contest promotion among teen-age boys and girls in the United States. Independent and Bell system telephone companies are cooperating with Kraft Foods Co., by making arrangements for the installations upon presentation of a certificate of authorization by each winner to the local telephone business office. The contest is a promotion for Kraft's Velveeta Cheese.

In the advertisements announcing the contest, the opening paragraph states the advantages of telephone service for teen-agers this way:—"Think what fun you'll have getting and making calls on your own private line (a separate line, not an extension!) A convenience for you and your parents! They'll be just as pleased as you are—to have you win your own telephone service."

Kraft Foods Company assumes the obligation for paying non-recurring charges for a residence line, color-

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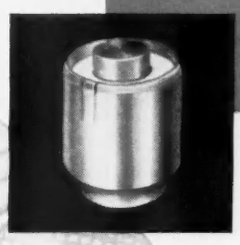

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CERAMIC INSULATION LIKE YOUR AUTOMOBILE SPARK PLUG—MADE OF CECOTITE, A ZIRCONEUM BASE CERAMIC MADE EXCLUSIVELY BY COOK ELECTRIC COMPANY

for the first time

REPLACEABLE PARTS WHICH CAN BE INDIVIDUALLY FIELD SERVICED AND REASSEMBLED INTRODUCE FURTHER ECONOMIES

*NICKEL MANGANESE ALLOYED WITH RU 78.

COOK ELECTRIC Company

Since 1897

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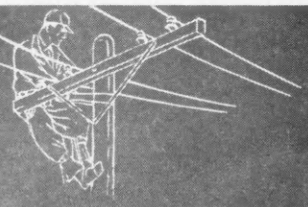


(Concluded from page 16)

ed telephone if desired and available, and a spring cord, along with 12 months of basic local service charges at the rate in effect at the time service is installed. Any other charges are to be paid by the contest winner.

THE 890-940 MC BAND

The US Independent Telephone Association is continuing its efforts to have the FCC allocate the frequency band 890-940 megacycles for common carrier service. At present, the 915 mc center of the band is theoretically set aside for industrial scientific, and medical uses, and because of "guard bands" the entire 890-940 mc space would be unusuable for common carriers wherever it was being used for ISM operations (which include industrial heating, electronic cooking, opening garage doors, and similar applications).

As a matter of fact, however, ISM use of the band is nil, and meanwhile common carriers, permitted to use the band for communications purposes if they do not interfere with ISM, have many operating units working on those frequencies, and perhaps $20,000,000 invested in the equipment. As a result, they have petitioned the Commission to set aside the band for the exclusive use of the common carriers. On the other hand, the FCC has pending a rulemaking proposal which would formally list the band as primarily allocated to ISM operations.

In its latest filing, USITA has asked the Commission not to take any action on the rulemaking proposal until it has held a hearing on the subject. It urged that a comparative hearing be scheduled at which the Commission would consider the common carriers' proposals and the FCC's proposal to list the frequencies for ISM purposes.

EXECUTIVE RESERVISTS

Defense Mobilizer Arthur S. Flemming has moved to implement a Presidential directive setting up an executive reserve for the federal government by authorizing government agencies having essential wartime functions to begin recruiting executive reservists —qualified men and women who voluntarily would fill executive government posts in event of mobilization. The agencies will conduct training programs for those in the reserve.

Reservists will be drawn from all segments of the national economy, Mr. Flemming stated, including industry, labor, agriculture, the professions, and public and private institutions. They must possess broad experience in such important functional areas as production, manpower, and tranportation. Those selected would report to Washington or to a regional office for training.

Reports at the time the reserve was announced by the White House singled out the communications and transportation industries as vital areas from which experienced personnel would be called upon to serve.

Training programs of the agencies will include orientation sessions, briefings on agency plans and programs to meet mobilization situations, and participation in agency preparedness tests under simulated conditions. Each reservist will have to submit to the agency concerned a statement showing that he would: be willing to attend a training course at least once a year; be immediately available for assignment in the event of mobilization; have the concurrence of his employer; and notify the agency concerned of changes in his personal status affecting his availability.

REA LOANS

Since our last issue REA approved the following loans: (1) $382,000, Diller (Neb.) Tel. Co.; (2) $337,000, 3rd loan, Smithville Tel. Co., Ellettsville, Ind.; (3) $335,000, Citizens Tel. Co-op. Inc., New Auburn, Wis.; (4) $208,000, Plao Pinto (Tex.) Tel. Co.; (5) $181,000, Cornersville (Tenn.) Tel Co.; (6) $117,000, 3rd loan, Granby (Mass.) Tel. & Tel. Co.; (7) $63,000, additional loan, SCVAK Tel. Co., Big Spring, Tex.

YOUTHFUL MEMBER

The Iowa Independent Tel. Assoc. recently welcomed an unusual new member — *The Chautauqua Park Tel. Co.,* owned and operated by 14-year old *Jimmy Marcusen.* Jimmy has a dial exchange in his basement at 2027 Nash Drive, Des Moines; has about 20 subscribers — all teen-agers within radius of one block. He started with manual service a couple years ago but soon found that service limited to time he could attend the switchboard was not so good — so like many progressive Independent telephone men, he converted to dial. According to Iowa Secretary *Bill Miller* the cutover was unique. Jimmy had all subscribers present and threw a party for them in the recreation room. Directors of IITA created a new membership classification and voted Jimmy a Junior member.

Here's Extra Business from homes or offices

HANDS FREE TELEPHONE

...and FREE literature to help you promote it

Telephone companies actively pushing this new instrument tell us that it is one of the most readily accepted items of all extra-revenue products.

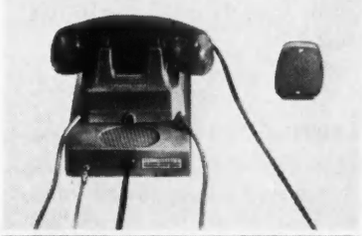
From executive suites to wholesale stockrooms and home kitchens, its convenience and streamlined modern appearance win friends and *customers*.

And *you*—the operating company manager—should know that Stromberg-Carlson has incorporated many improvements over other loudspeaking instruments, so that greater subscriber satisfaction, as well as a reduction in service needs, is assured.

What's more, we offer, for FREE, handsome sales literature designed to help your commercial man in his contacts, or to be left with the prospect for silent salesmanship. Why not contact your nearest representative right away for an instrument or two to use in demonstration-selling.

1. To put this two-piece instrument into operation requires only connection of the line cord, plug-in to a 110-volt AC outlet and attachment of the mike cord. 15 minutes: Some designs take 3 to 4 hours to install.

2. No longer need a ringing 'phone go unanswered because of dishes or baby's bath. The housewife presses one button, and carries on a conversation while continuing her work. Mike cord is 12 feet in length.



3. The Stromberg-Carlson **Hands-Free** telephone has AVC*. If a subscriber uses the mike too close to his or her mouth, the instrument automatically compensates to prevent the usual unpleasant "boom." And there's almost complete absence of coupling.

4. Profusely illustrated, 4-page, two-color, 8½ x 11 inch selling brochure is offered free-of-charge in reasonable quantities. Just specify Sales Folder number T-159 from your nearest Stromberg-Carlson sales office.

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Management NEWSLETTER

- Absenteeism Costs Industry $5-Billion Yearly.
- Controllership Foundation Cites Automation Headaches.
- Interest in "Executives' Diseases" Is On The Increase.

ABSENTEEISM

Absenteeism is costing industry more than five billion dollars yearly, says Research Council for Economic Security, Chicago. Illiness absences alone, the Council indicates, cause the loss of the services and production of a million workers every year. It opines that if all absenteeism data were available the loss might be found to be as much as ten billion dollars.

"This is a problem," says Gerhard Hirschfeld, Director of the Council, "which is in need of much more attention than it has received before. In addition to the production loss there is the direct loss of wages and income for the workers and the cost of medical care. These are considerable even with the extensive protection of group sickness compensation, hospitalization, surgical insurance, and prepaid plans prevalent in industry today."

A recently released Research Council book entitled *Absenteeism* contains a summary of the discussions at a seminar and workshop on absenteeism conducted by the Council last year. Among other things the book points out are that the real causes of absenteeism are many. They involve general factors of morale, attitudes toward the supervisor and toward the company, proper job placement, sense of responsibility, home and family influences and problems, the health of the worker. Plans which depend solely on getting rid of the so-called absence-prone worker or disciplining the chronic absentee miss the mark and accomplish neither the prevention nor the control of absenteeism.

AUTOMATION "HEADACHES" CITED

It takes time, money, training and thought to live with a mechanical brain and adjust to the latest phase of the automation age. Last month The Controllership Foundation, Inc., told management in a report of "Electronics for Business" not to expect to make the jump quickly nor without long planning. The foundation reports on a case study of the experience of the Port of New York Authority which operates bridges, tunnels and airports. The foundation reports that in 1949 the Port Authority began looking for an automatic system. In 1954 the port authority set up an electronic research division. It found 35 employes qualified for the 12-hour examination, which eight passed. Postponing for the time being its search for the machine to do the toll computation economically, the Port Authority last year decided to lease a general purpose electronic computer. It will be installed this fall. The foundation points to this long, slow and difficulty strewn experience in warning businessmen to expect planning problems.

Another case history comes from the comptroller of Pacific Mutual Life Insurance Co. of Los Angeles. He says the two million dollar outlay for its large scale computer system will pay for itself in five or six years through savings on clerical costs. But it has required a two-year period for training 30 programmers and coders to run the equipment and the preparation of a 7,000 square foot site for housing the 17,000 pound system.

PROMOTION VERSUS HEALTH

The interest of U. S. industries in so called "executive diseases" is on the increase. Last month *Dr. Robert Collier Page,* medical management consultant, New York City, urged each executive "to know what his health is and to learn to live within the budget nature has given him."

The prospects for every able man and woman to get ahead today are enormous," he said. "Unless you are up to the challenge mentally and physically, your next promotion could materially affect your future. Your capacity for tension has a limit beyond which it isn't safe to go."

Dr. Page pointed out two danger signals: (1) if you find you like responsibility but not the work you do; and (2) the fear of delegating authority. "Probably the oldest and most disregarded rule for exercis-

Sound reasons

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- Copperweld* Line Wire "talks better" than any other high-strength conductor, due to its thick, molten-welded copper covering.
- Copperweld retains its high transmission efficiency permanently, because it can't rust.
- Copperweld is the only long-span conductor suitable for carrier. When you build with Copperweld, you can convert to carrier circuits, when required, without additional investment in overhead lines.
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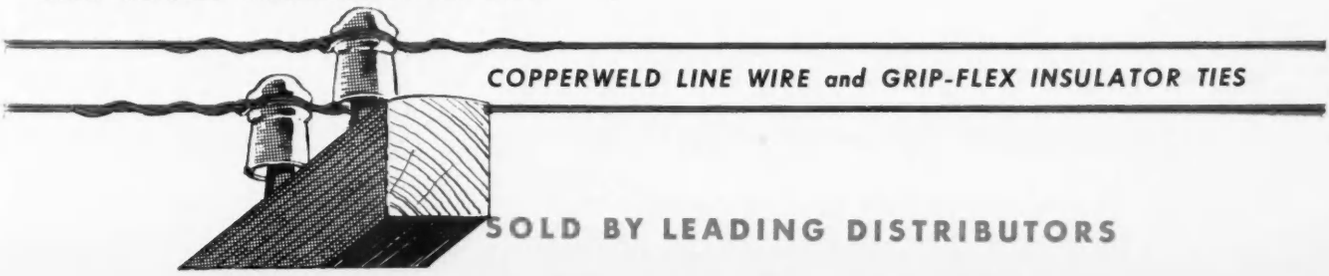
the ideal combination...



COPPERWELD LINE WIRE and GRIP-FLEX INSULATOR TIES

SOLD BY LEADING DISTRIBUTORS

Management NEWSLETTER

(Concluded from page 20)

ing authority is to share it," he said. Unless you can accept that rule, you don't belong in your job. Being overly aggressive is another danger. It may bring rapid promotion, but eventually a crisis arises in which you find your enemies outnumber your friends . . . The important danger signals and what they mean must become more common knowledge. This may entail limitations which seem difficult to cope with at first, but in the long run less food, less liquor, and tobacco, less travel, more exercise, more leisure, more delegation of authority will prove of benefit to all concerned.

IN THE CARDS

A novel plan to get employes safety conscious is in force at a Kaiser Aluminum plant in Mead, Wash. The theme is based on a poker game. Part of the program involves chance, part involves the ability of employes to memorize safety slogans. Up to $100 pots weekly are awarded to winners. Employes with lost-time accidents do not qualify. With money as a motivator, the plan has been highly effective.

BUYING POWER

Disposable personal income (after taxes) by 1956 should be well over $380 billion — approximately $7,000 per household, *Vergil D. Reed*, vice-pres. and associate director of Research, J. Walter Thompson Co., forecast last month.

Addressing the American Management Association Marketing Conference Reed said, "output per man hour is going up at a faster rate than in the past — in fact, at a rate of 3 per cent annually. Since this rate is compounded annually, we could double our productivity in the next 15 or 16 years in both industry and agriculture. If productivity continues to increase at the 3-per cent-a-year rate, gross national product should reach $535 billion (in 1953 dollars) by 1965. Personally, I think our productivity will increase further. If average hours of work remain at 1953 levels, we could easily turn out $575 billion in 1965."

Since* 1950, *Mr. Reed pointed out, our population has increased by more than 15,800,000 or four Irelands. . . . "Between now and 1960 our market will increase by almost a whole Canada. Between 1960 and 1965 it will increase by the equivalent of a Holland or two Switzerlands. In 1965 there will be more than 190 million of us. These are the increases to which we must attune our businesses," he said.

Almost four million babies were born in 1953 and slightly more than that in 1954 and in 1955. "We're turning them out at 480 per hour or 11,520 per day — and haven't even tried automation yet." Beginning with 1962, *the increase in the number of new households established each year "will be a market gold mine.* Households, not individuals, are your customers for most types of consumer goods."

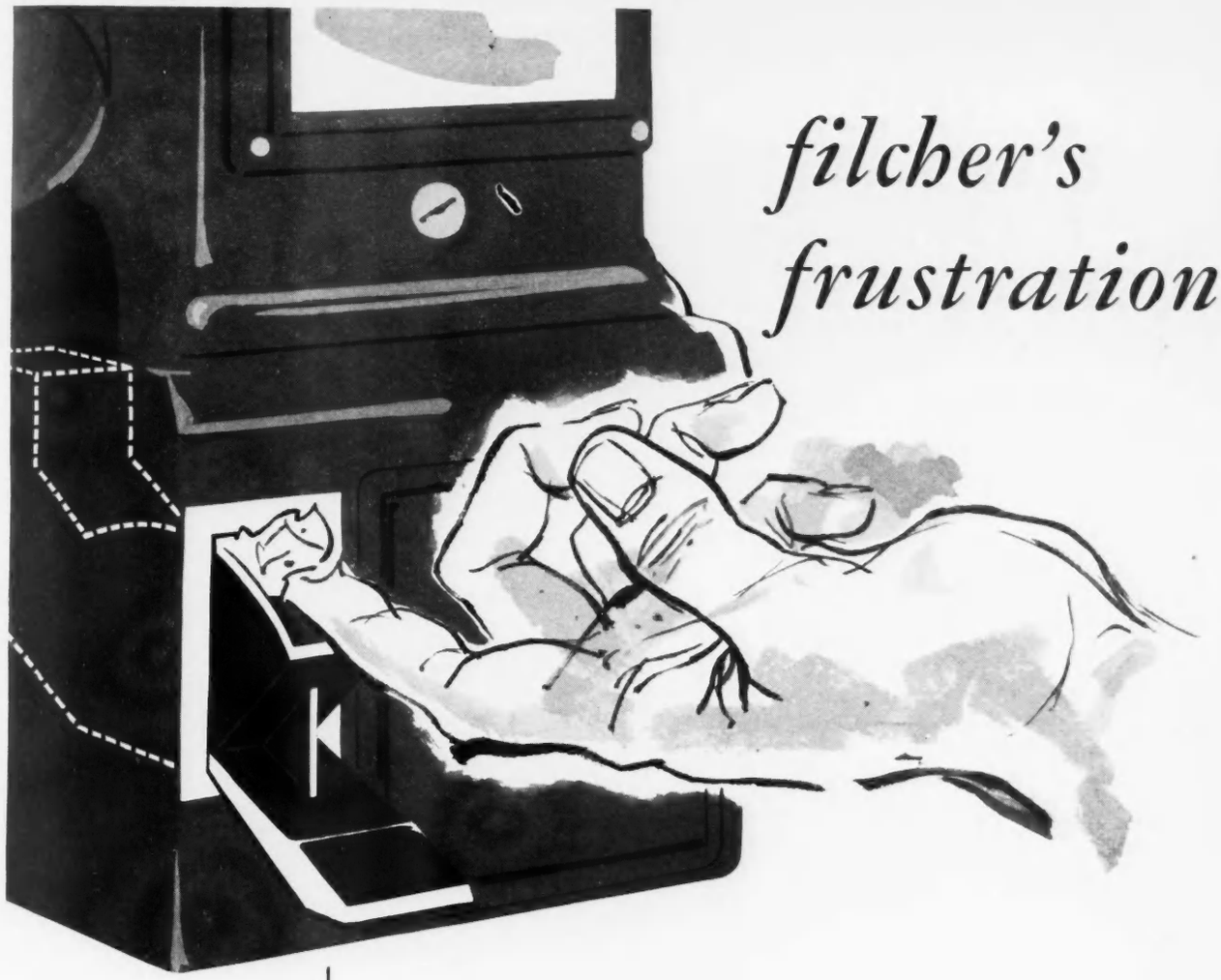
"Even the Grim Reaper is on our team," Mr. Reed asserted. "We have added over 31 years to our male and over 36 years to our female life span since 1850. A white boy born in 1960 will have a life expectancy of 69.6 years. His sister's expectancy will be 77 years. *That increased life expectancy and decreasing mortality rates add greatly to the richness of our market* is an obvious, but often overlooked, fact. Adding 20 to 30 years to the time a customer buys, with higher purchasing power in the mature years, is better than was adding a new customer in our grandfather's market."

MANAGEMENT BOOKSHELF

***"The Economic Almanac*, 1956,"** Thomas Y. Crowell Co., 432 4th Ave., (Dept. TE&M), New York 16, N. Y., $3.95. Compiled by the National Industrial Conference Board, the "Economic Almanac" meets the need for a compact convenient handbook of the latest, most significant and trustworthy statistical data.

This, the 13th edition, includes more new or revised material than any of its predecessors. Much new data will be found on consumer credit; saving and liquid assets of individual; federal, state and local finance; population; stock ownership; central bank reserves; and international economic relations. The public finance section, in particular, has been revised almost in its entirety in order to make long-term historical data more readily useful. In the fields of personal saving, consumption, and debt the important work done by statisticians in recent years has been summarized.

"Effective Communication On The Job," *American Management Association*, 1515 *Broadway*, New York, 36 N. Y., 296 pages, $5.50. An executive is a man who gets things done through people. Whenever he gives orders, explains procedures, discusses and implements decisions, he relies on "face-to-face" communication. Social scientists have paid increasing attention to communication recently, but this reaearch is often abstract and not immediately relevant to the needs of the businessman. Since American business spends countless dollars and hours getting ideas across, a necessary prelude to *getting things done*, this handbook on effective communication should be a most useful addition to every executive's library.



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With Automatic Electric's Anti-Stuffing Coin Return, your customers *get* their coins—and *you* avoid complaints!

It makes blocking paystation coin-return chutes an impossibility. When closed, nothing can be inserted into the chute. When open, the refunded coins are instantly accessible.

The Anti-Stuffing Coin Return fits both new and existing paystations. As you order new paystations, always specify: "Equip with Anti-Stuffing Coin Return". To modify existing paystations, the lower housing assembly may be replaced, or a separate kit is available to convert it. Write today for price and delivery information. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

Washington NEWSLETTER

- No Agreement Reached on Toll Compensation Schedules.
- Court to Review Provisions Barring Foreign Attachments.
- Government Committee Studies Network TV Problems.

TOLL COMPENSATION

Several representatives of the Independent telephone industry were working in Washington late last month on revised toll compensation schedules, after a joint US Independent Telephone Association-Bell System meeting failed to produce final agreement on a new settlement pattern. Although another joint meeting had not been scheduled, informed sources said another session in mid-March was likely.

USITA Executive Vice President Clyde S. Bailey reported that the association's Toll Compensation & Settlements Committee found the settlement pattern proposed by the Bell System to be adequate, and that the increases and decreases which would apply if the procedures were made effective across-the-board would not adequately offset the increased cost of handling interchanged business since the last adjustment, which was effective Jan. 1, 1953.

A counter proposal, involving adjustments of the Bell System's recommended pattern, was presented by the Independents, but did not meet with approval by the Bell System representatives, Mr. Bailey said. Industry spokesmen believe that real progress is being made toward a new toll compensation arrangement, particularly in the general agreement that determination of Independent company costs is the soundest basis for arriving at schedules. Absence of a settlement, however, results from difference of opinion as to how costs should be computed, particularly in the line haul schedules.

Work on obtaining cost data from a cross-section of representative Independent exchanges, and establishing cost curves which can be used to determine "A" and "B" and line haul schedules, has been going on for upwards of a year. It appears likely that most Independent companies, particularly the smaller firms, may expect some increase in their toll settlements fairly soon, regardless of the outcome of the joint meetings.

FOREIGN ATTACHMENTS

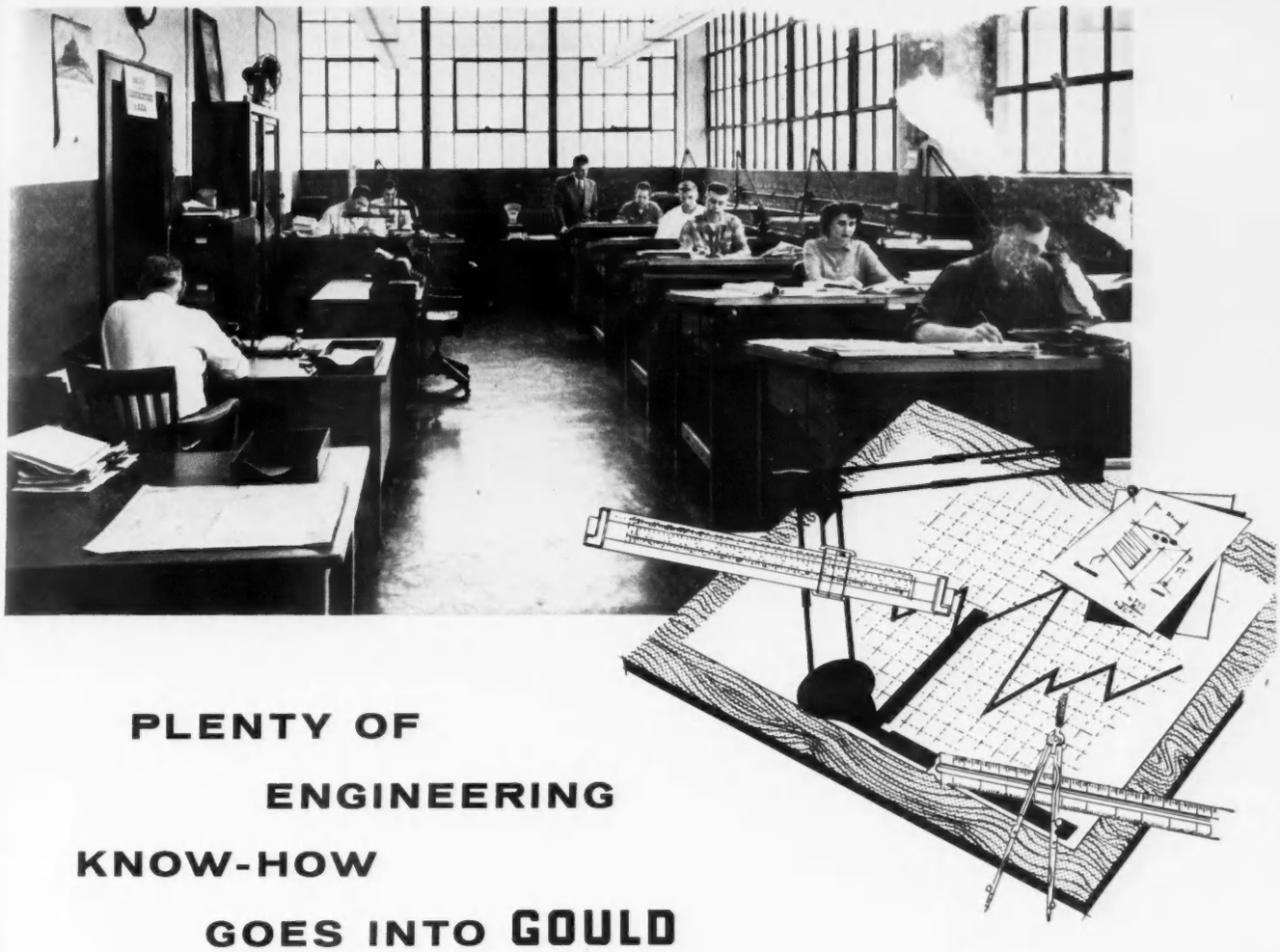
The first review by a federal court of telephone companies' tariff provisions barring foreign attachments is now anticipated, following a notice of appeal filed with the US Circuit Court of Appeals for the District of Columbia by the Hush-A-Phone Corp. Hush-A-Phone manufactures a cuplike device intended to fit over the mouthpiece of a telephone handset, which is intended to give the user more privacy and tend to keep out surrounding noises.

More than six years ago, Hush-A-Phone complained to the Federal Communications Commission about the foreign attachment provisions of Bell System companies' tariffs. The Commission held hearings, issued an initial decision rejecting the complaint, and then, after the case hung fire for more than four years, finally put out a final ruling in December, 1955, again turning down Hush-A-Phone. The Commission took the position that the Hush-A-Phone tends to impair telephone service, and that it is not unreasonable for the companies to ban the use of the device by their subscribers.

In its appeal, Hush-A-Phone directed much of its fire at antitrust questions. It said the FCC failed to consider that the "antitrust laws are violated by the foreign attachment provisions" and did not take into account that "where a tariff provision is in fact violative of the antitrust laws it could not be 'just and reasonable' or otherwise lawful." Errors alleged in the filing included failure of the FCC to hold that the Bell System "is unlawfully interfering with the natural and inherent rights of a subscriber to use an office device related to the efficient conduct of his business." The petition said the foreign attachment rule should not be construed to "cover office devices . . . not connected to telephone circuits either physically or electrically." Furthermore, it was contended, the FCC has no jurisdiction to regulate "office devices."

NETWORK TV

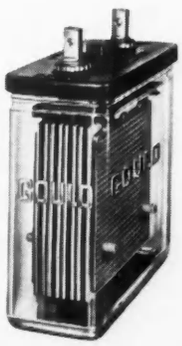
Current hearings by the Senate Interstate & Foreign Commerce Committee are centered on network television problems, but testimony of interest to telephone companies which provide program transmission



PLENTY OF ENGINEERING KNOW-HOW GOES INTO GOULD RESEARCH BUILT BATTERIES!

On the drawing boards in the Gould engineering department, theory is made practical. Drawings and specification charts indicate the right plate size, battery case size, the eventual battery capacity, how grids should be cast, how active material should be mixed and how the battery should be constructed—to make sure you get the right battery for the right job!

One more reason why you get better batteries first from Gould!



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Washington NEWSLETTER

(Concluded from page 24)

service to TV stations, or which may do so in the future, has cropped up. Chief Harold G. Cowgill of the FCC Common Carrier Bureau has advised the Senators at the hearings that the Commission staff will have ready for consideration by the Commissioners in the very near future new rules governing private intercity TV relay systems constructed by broadcasters.

Commissioner Rosel H. Hyde, speaking for the FCC on policy questions dealing with intercity relays, said the previous policy that a common carrier could best handle intercity transmission has been "relaxed by degrees," and that the Commission has been "following a very liberal policy" in approving private systems.

Declaring that the rapid development of TV has brought "many calls" for program transmission, frequently from markets which could not pay the costs involved for common carrier service, Commissioner Hyde declared: "Now the Commission has recognized the realities of the situation. Where it appeared that the carrier could not provide the service as quickly as needed or where the conditions were going to be very burdensome for the market, and where it did not appear that the granting of the private facilities would cause any untoward effect on other stations, we have issued permits for the private links. It has seemed to me not a bad policy to issue permits for private links to people who could demonstrate ability to provide that service at low cost. It is just another example of use of competitive techniques to get a desired result."

Asked if the Commission has studied the costs of private systems, Mr. Hyde said it has not, and that there are "great differences" between private and common carrier operations, in that the broadcaster may be able to use his existing technical staff to operate the relay, and "may content himself" with service not up to the technical standards of common carriers.

During a later discussion about the rates charged by telephone companies for intercity TV service, FCC Chairman George C. McConnaughey commented, "I think we should tell you they're very apt to go up." Responding to questions on the same subject, Mr. Cowgill reported that an informal review of the Bell System's intercity TV rates has been continuing for a long time, with three separate studies of the System's video costs conducted since 1948. He recalled that the rates were protested by telecasters when first filed, but that the resulting proceedings has never been closed.

He said the FCC has made no decision on the reasonablesness of the rates, and Chairman McConnaughey then injected his comment about a possible increase, adding that it was based on the telephone companies' costs of providing the service. This brought the discussion to an abrupt halt.

AIR-TO-GROUND SERVICE

An initial exploratory meeting of interested parties on the possibility of a public air-to-ground telephone service was held March 7, following requests to the FCC by two aviation organizations for rule changes to permit use of aeronautical frequencies beyond the present limits of air navigation, traffic control, and emergency communications.

The National Association of State Aviation Officials asked the Commission to allocate a suitable frequency in the aeronautical band for air-to-ground communications by airline passengers and for other than operational or safety uses.

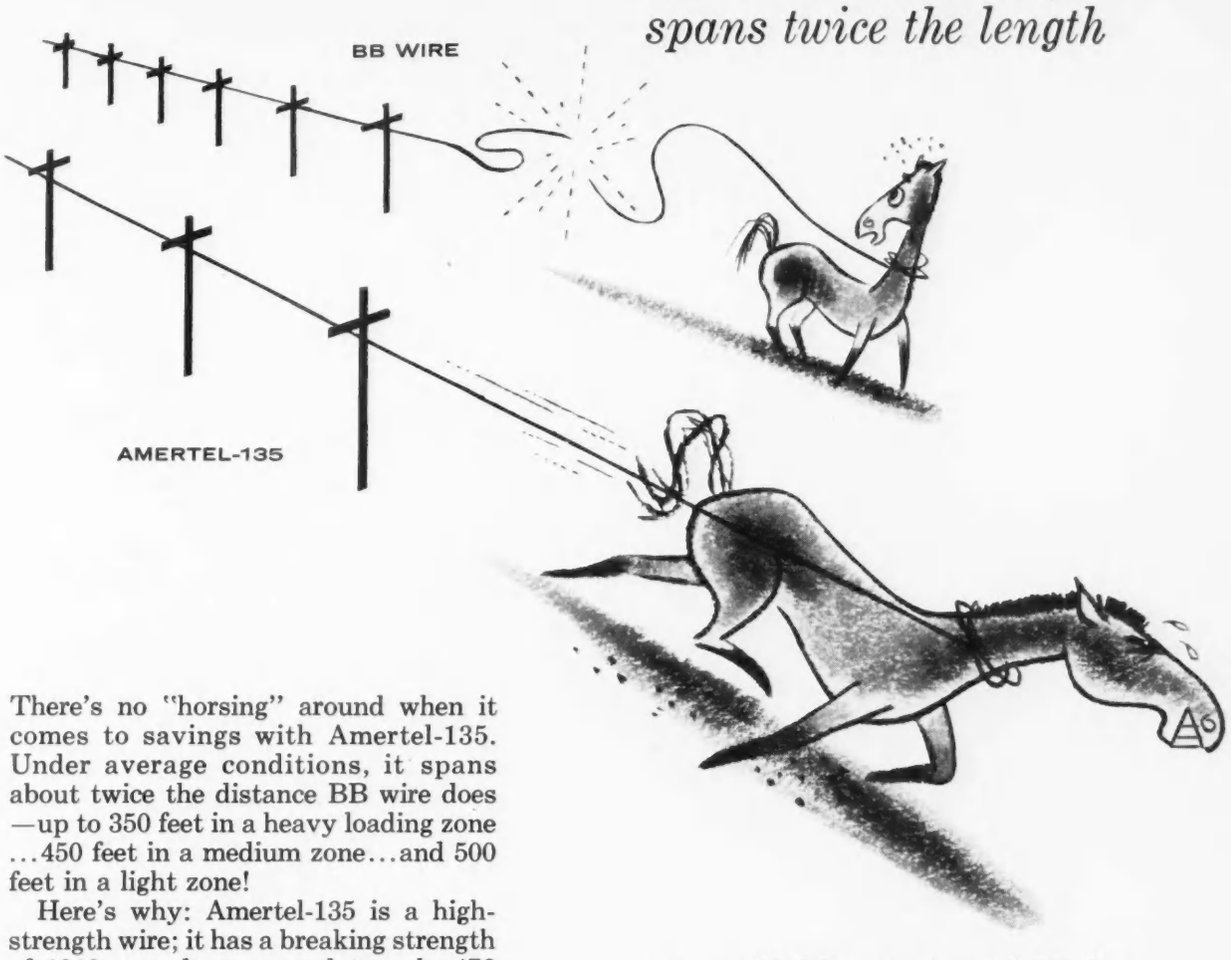
Earlier, a private flyers' association, the National Business Aircraft Association, requested the Commission to permit non-operational and safety traffic on an already-licensed frequency.

In its resolution submitted to the Commission, the state highway officials' association called for encouragement to the nation's telephone companies "to install and operate the ground facilities and equipment throughout the United States necessary to provide efficient air-to-ground telephone service." Association President C. A. Moore said there is a growing need for this type of service "to make possible pilot requests for ground transportation, airport service, etc.

Anouncing its filing with the Commission, the state officials' group compared the proposal with the present ship-to-shore telephone service. It said the use of air travel by businessmen is growing, and that they could "profitably utilize" air-to-ground telephone service while traveling. Interconnection of the ground stations for the service is regarded as essential, since a plane might go in and out of the range of one or more ground stations while a conversation was going on. In earlier consideration of such service, the problem of the weight of additional communications equipment aboard aircraft was significant, but it is now thought that with miniaturization it might be possible to develop units sufficiently light in weight. — ***By the editors of "Telecommunications Reports."***

AMERTEL-135

has twice the strength
spans twice the length



There's no "horsing" around when it comes to savings with Amertel-135. Under average conditions, it spans about twice the distance BB wire does —up to 350 feet in a heavy loading zone ...450 feet in a medium zone...and 500 feet in a light zone!

Here's why: Amertel-135 is a high-strength wire; it has a breaking strength of 1213 pounds compared to only 476 for BB. With Amertel-135 you can make your spans longer, and use fewer poles, fewer crossarms, and less hardware. Compare the distance between poles in a medium loading zone:

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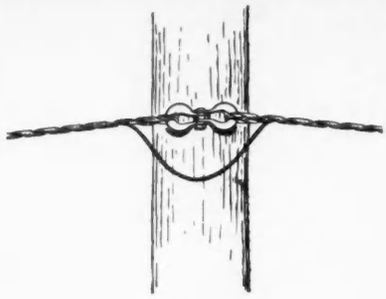
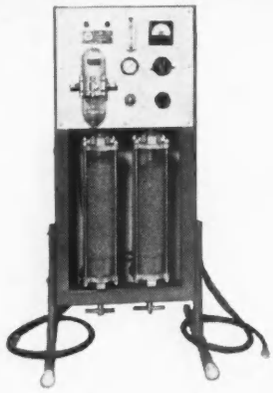


Preformed Dead-Ends for self-supporting plastic cable. Both long and short dead-ends available. Easily applied without the use of special tools. Merely slip one leg through a standard hardware thimble clevis and wrap the legs around the cable. PREFORMED LINE PRODUCTS CO.



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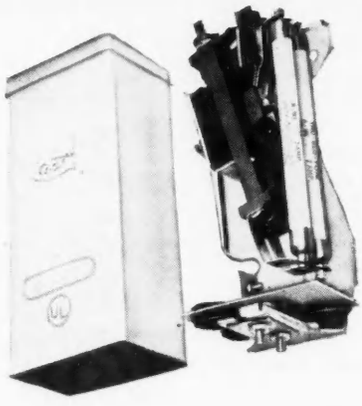

Unusually Durable! The high-insulating value and great tensile strength of the Bakelite used in the Type RO-9u Sub-Station Protector Mounting provides great resistance to breakage from shocks of electrical discharge. COOK ELECTRIC COMPANY.

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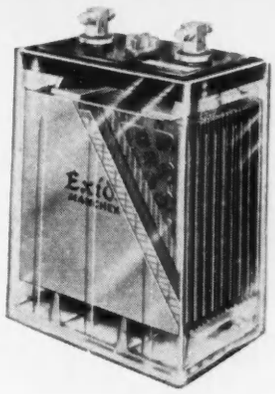
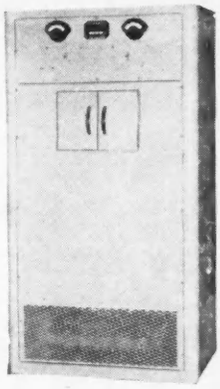
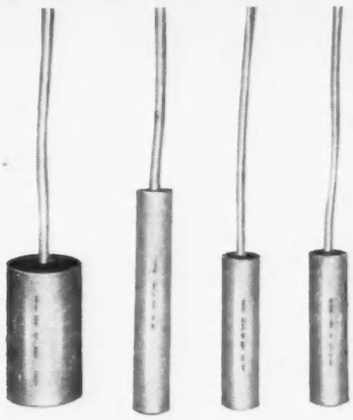
Simple, Quick and Sure!— For splicing two wires of different sizes, there's nothing simpler than using Nicopress reducing sleeves and the Nicopress 31-DC tool. Splices are always tight and strong. Made by the NATIONAL TELEPHONE SUPPLY COMPANY



This Battery Keeps Itself Young For Years
The Exide Manchex Battery has a reserve supply of lead always available to be converted into active material as needed. Hence the unusually long battery life. Exide Industrial Division. ELECTRIC STORAGE BATTERY COMPANY.



Self-Contained Unit —The 3-phase Flotrol Automatic Constant Voltage Battery Charger has no moving parts — all components in one cabinet. Designed for plants requiring 25 to 400 amps charging capacity. LORAIN PRODUCTS CORPORATION.



Application of Loading Coils on telephone circuits reduces loss to 1/3 or 1/4 the non-loaded value — coils shown are used on a 2-wire telephone circuit in non-quadded paper insulated or plastic cable. COMMUNICATION EQUIP. & ENGR'G. CO.

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KELLOGG SWITCHBOARD AND SUPPLY COMPANY
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Max E. Wettstein has been President and General Manager of the Florida Telephone Corporation since 1953. His 25 years of active service with the Company in varying capacities makes him well qualified to serve as its chief executive officer. Mr. Wettstein's thoughts about Graybar are presented below.

"We have always valued highly our relationship with Graybar"

The growth of the Florida Telephone Corporation in the past ten years has been extensive. Total telephones in service have increased from about 9,000 to nearly 30,000 and now, a continuing major project is even greater expansion to keep up with subscriber needs in this fast-growing State.

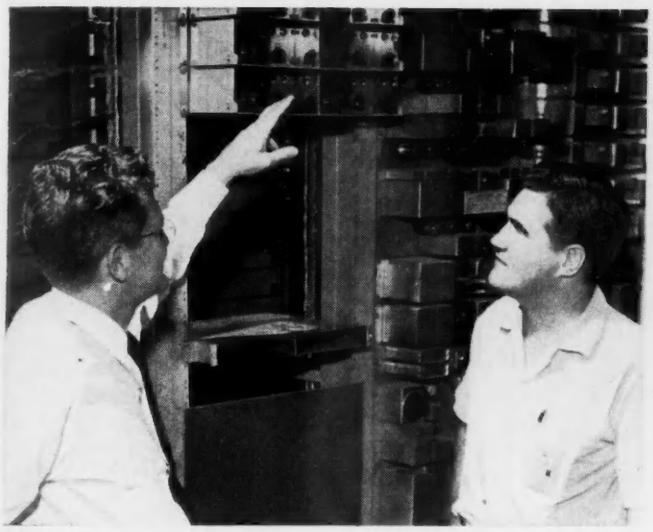
Concerning Graybar — Max E. Wettstein, President and General Manager of the Florida Telephone Corporation, says:

"Graybar has furnished us with line supplies, telephone instruments, cable and all of the various and sundry items comprising basic telephone plant for a long period of years.

"Throughout these years, we have experienced excellent Graybar service and have enjoyed the use of their quality products. Graybar has given us a specialized service through their experienced local representatives and nearby warehouse facilities which we feel is unsurpassed. In normal operations and in the many instances involving special treatment of urgent orders, Graybar has always come through to our complete satisfaction.

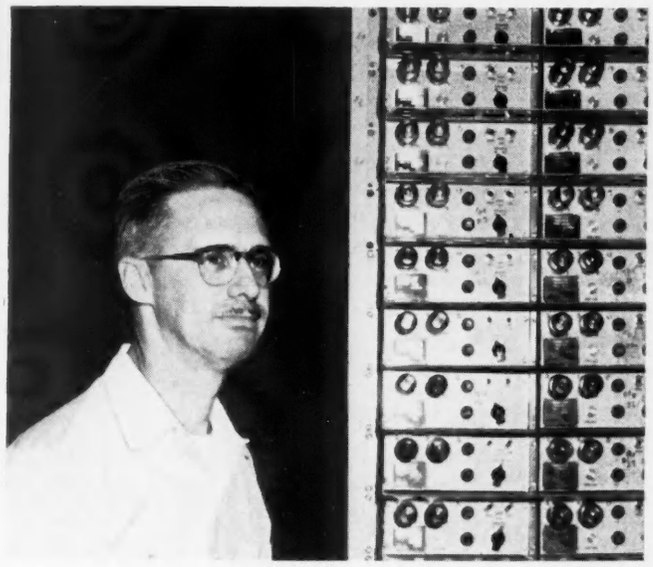
"We have always valued highly the fine relationship which Graybar and Florida Telephone have had with each other".

Thanks, Mr. Wettstein—we feel the same. And that's the way we operate throughout the United States, too. Many independent telephone companies rely on Graybar's warehouse system to carry their inventory. Pole line supplies for maintenance and new construction . . . central office equipment . . . subscriber carrier and toll circuit carrier . . . linemen's tools and safety equipment — all are conveniently available from Graybar located nearby. You too can benefit from Graybar's services. Call us for any telephone need. Like you, we are proud of our independent status. Graybar is owned solely by its operating and retired employees.



New Lynch B112 repeater installation is inspected by R. D. Eshbaugh, Chief Equipment and Building Engineer, and W. C. "Spec" Winfree, Graybar Manager of Communication Sales (pointing). The Florida Telephone Company now operates 18 exchanges and 5 subexchanges in eight counties in Central Florida. An accelerated expansion and improvement program will soon see its five remaining manual exchanges converted to dial operation.

Progress of a construction crew building additional rural lines is checked by Ralph Oswald, Plant Engineer, and Charles Whitaker, Line Foreman (left and right background). For both new construction and everyday maintenance, Florida Telephone management recognizes the importance of quality tools and supplies that their line crews know and respect and which are quickly available from Graybar.



H. G. Williams, Equipment Maintenance man, stands before the Lynch B112 repeater bay in the Winter Garden Toll Center and Exchange Building which was constructed in 1954. These repeaters are used with a new cable recently installed between Apopka and Winter Garden to expand facilities to the Winter Garden Toll Center.

Here Graybar Salesman John Coleman and General Plant Supervisor and Purchasing Agent John Riggs, at right, interrupt their discussion of a list of telephone supplies ordered from Graybar to smile for the camera. Graybar's specialized services and experienced personnel have done much to cement the healthy relationship between it and the Florida Telephone Corporation.

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Graybar QUALITY *Everything Electrical*

IN OVER 130 PRINCIPAL CITIES

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THE BEST IN PRESERVATION

Specify T-C Pressure-Treated Poles

When you order poles stamped with Taylor-Colquitt's familiar "T-C" you can be sure you are getting "the Best in Preservation" .. . Here's why, every step in T-C production is subject to precise and accurate control. These controls cover timber selection and pole manufacture as well as moisture removal and preservative treatment. Developed and refined during the 30 years Taylor-Colquitt Company has been a producer of fine poles, these controls insure you uniform quality and consequent maximum life.

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PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

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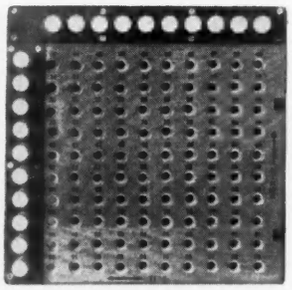
(ONE MAN) CABLE TESTER

NOW, for the first time ONE MAN can test to identify cable pairs and do it three times as fast as two men could formerly do the job. "ONE-MAN" splicing crews are now a reality. On new cable work, labor costs are reduced by from 30% to 50%, depending on just how far you are prepared to go in utilizing the One-Man crew.

Model CMU Meter Unit

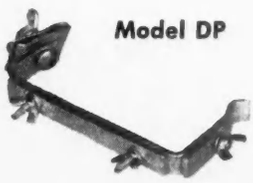
The still further improved Model C Meter Unit, Model CMU. Three Test Sets in one — THE MURPHY ONE MAN CABLE IDENTIFIER, The Buzzer Continuity Tester — and the Ohmmeter for locating trouble.



Model TTB, Combination Tag and Terminating Board

This is the new board that automatically sorts and groups the wires just the way you need them for connecting to the binding posts of the terminal board — only, in this case, the Terminal Board is built right into the Tag Board.

Model DP



Dual Purpose Clamp

This dual purpose clamp will hold the Terminating Board or the Meter Unit at any angle, above or below the strand, for convenience during use.

Durable Steel Cases For All Units . . . . . *Write for prices, terms, etc.*

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Building today for tomorrow
---*TOGETHER*

Looking back, it is easy to appreciate how much the early pioneers did for the Independent Telephone Industry. And to see how research and manufacturing companies helped to build a new industry into a dynamic, thriving enterprise.

But, in our industry it is even better to look ahead, for its growth and progress never stop!

Right now — *today* — associates of the International Telephone and Telegraph Corporation, a world leader in telephony are working, planning — providing faster switching and improved speech circuits. They are developing new techniques to make maximum use of the latest advances in the technology of communication.

As research center of IT&T in the United States, Federal Telecommunication Laboratories have dozens of new research projects in the working stage. They will make today's best communication systems *even better* . . . perfecting the application of electronics to national subscriber toll dialing . . . bringing to the Independent Telephone Industry, the most advanced developments of science.

Kellogg Switchboard and Supply Company is proud to be a partner with IT&T and Federal Telecommunication Laboratories in this drive for better communication . . . for the betterment of the entire Independent Telephone Industry.

Build for the Future...

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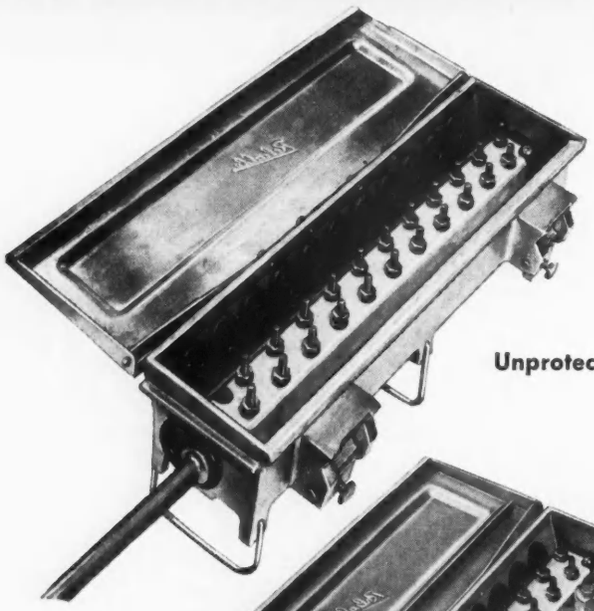
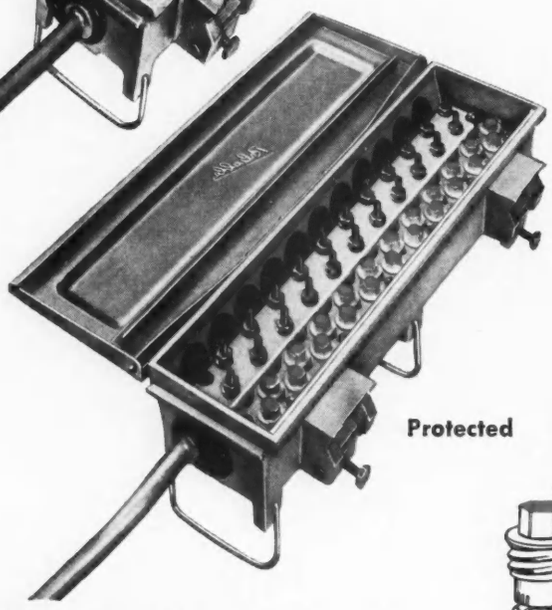


Unprotected



Protected

Protector Unit

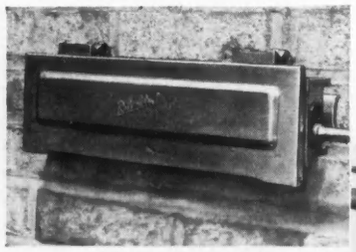
Here is cable protection at its best — the easiest and least expensive to maintain — the most versatile in application.

The heart of the Reliable "ST" Protected Strand Cable Terminal is the screw-in — screw-out Protector Unit, which is quickly and easily restored by cleaning and for replacing parts when permanently grounded by lightning, power-cross currents or other heavy discharges. Normal static discharges are arrested by carbon to carbon air gap and require no maintenance.

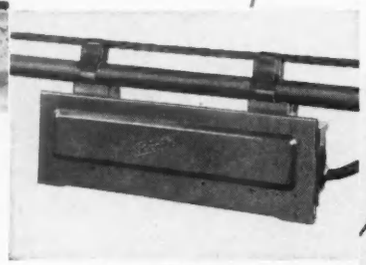
These Protector Units are sealed, yet the carbon blocks and lead alloy pellets are easily removed for cleaning or replacement. Two types available — one for cable protection, the other for fuseless station protection.

The "ST" is also available "unprotected." Further versatility of the Reliable "ST" is the provision for strand, pole or wall mounting. Stub cable entrance holes are provided at opposite ends for stub reversal.

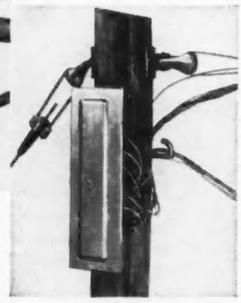
Four sizes — 6, 11, 16 and 26 pair — are available in each (Unprotected, Cable Protection and Fuseless Station Protection) style.



Wall Mounted



Strand Mounted



Pole Mounted

Ask for full information — write for Reliable "ST" Cable Terminal specification R-100

Reliable

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Telephone Protective and Terminal Equipment for all Station, Line and Central Office Needs

OVER 45 YEARS SERVICE TO THE UTILITIES

EDITORIAL

"The Bite That Hurts"

ON AT LEAST three occasions during the past five years we have suggested — "There are some things the public should know and is entitled to know about the telephone business — such knowledge would lead to a better understanding by the public of some aspects of telephone service and of telephone rates . . . . . "

This statement bounced into our thoughts the other day when our good friends at Illinois Bell sent us a bulletin titled — "Taxes, *Second Biggest Item In The Public's Telephone Bill* . . . . . "

The timing of the bulletin was excellent. We had just signed our "John Henry" on a Form 1040 and had addressed an envelope to Uncle Sam's local tax collector. Filling out that form had made us fully aware of *direct* taxes. Reading Illinois Bell's bulletin made us realize the government took more from us in '55 than we realized.

The Illinois Bell bulletin pointed out a few things which made us realize the *extent* to which taxes determine the price of things we buy. For example: —

(1) In 1955 telephone taxes on Illinois Bell and its customers reached the total of 113 million dollars. That's roughly 15 million dollars more than the *total amount* Illinois Bell customers paid for telephone service in 1940.

(2) Taxes averaged $3.10 per month per telephone. Of that total, company operating taxes averaged $2.18 and Federal Excise Taxes 92 cents.

(3) 27 cents of every dollar collected from Illinois Bell customers went to local state and federal governments.

As we read on we wondered how many U. S. telephone subscribers know that the *second biggest item in the cost of telephone service is taxes.* We believe it is doubtful if everybody realizes just how big a slice of profits it is that the Federal government and other taxing bodies take as compared with what the investors in the business receive.

Not so long ago the bondholders and stockholders received the largest share of the profits of a business. But now the tax collector gets the biggest — and first — bite. That era started when the Revenue Acts of 1941, 1942 and 1943 were enacted while the U. S. was either at war or preparing for war. Their combined effect was to tax those communications services not taxed under the 1932 Act and to raise the tax rates on all the services to new levels.

For about a decade the Excise Tax was 15 per cent on local service and on out-of-town calls under 25 cents, and 25 per cent on other long distance calls. By an Act of Congress, these tax rates were reduced to 10 per cent on April 1, 1954.

All industry members know the 10 per cent Federal Excise Tax is a tax levied directly on telephone users. They know the telephone company is required to bill and collect it from subscribers and turn the money over to the federal government.

Such knowledge on the part of industry members is of course, important. But equally important, we believe, is the sharing of that knowledge with subscribers.

We think the tax problems of a telephone company should be revealed to its subscribers. Somehow they should be made to realize:

(1) Taxes are higher in the liquor and tobacco industries, but so far as can be determined, no major industry — except those two-bears a heavier tax burden than the telephone industry.

(2) Other necessary household services such as gas, electrical energy and water bear no Federal Excise Tax. At 10 per cent, telephone calls are taxed at the same rates as are such items as furs and jewelry.

These things, if more generally known, would, we believe, help to a better understanding by the public of their bills for service.

In fact if the industry's tax story is made plain to all subscribers they just might realize that taxes on telephone service is truly one tax bite that deserves their attention!

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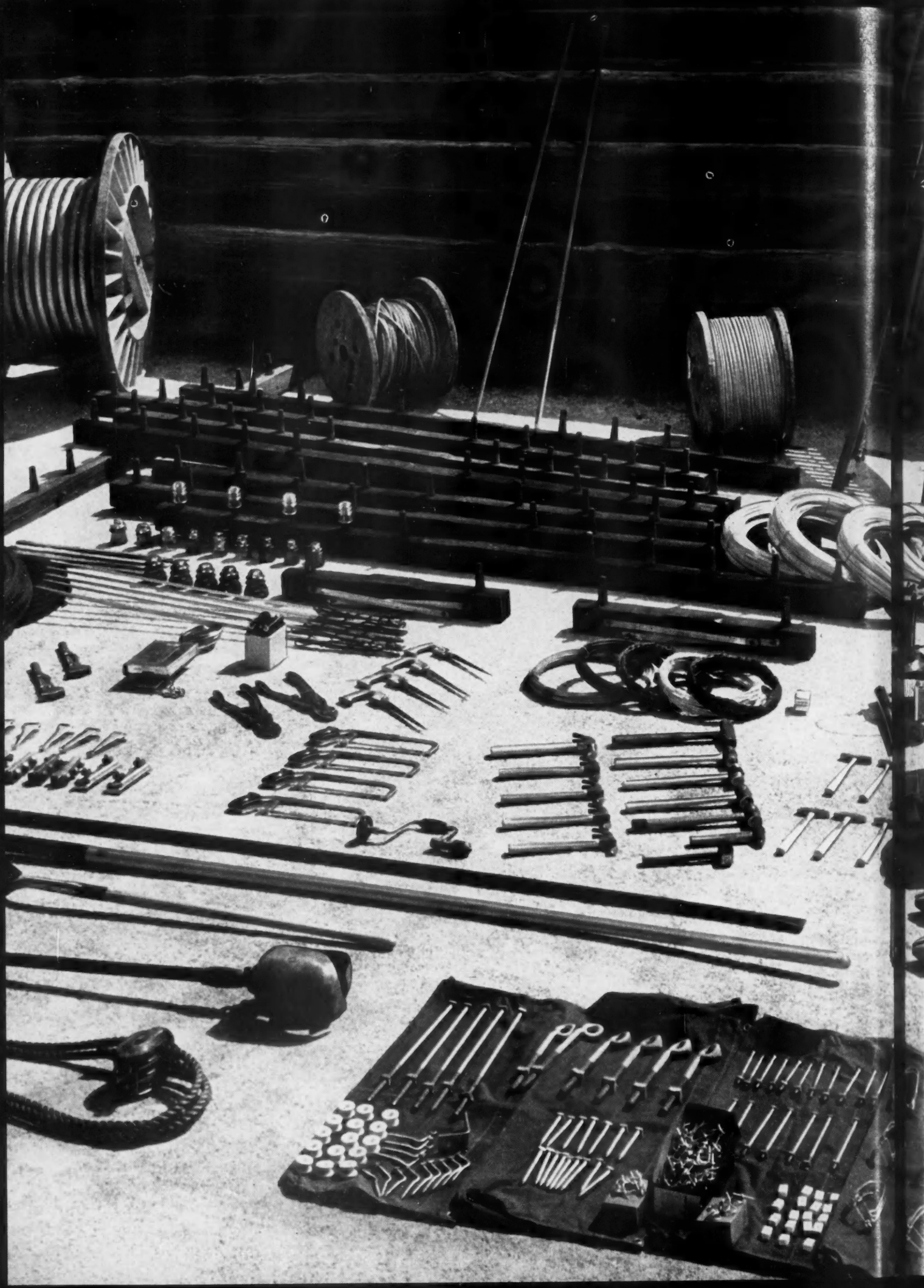

Are you collecting these 2 dividends on your supply dollar?

As you receive each shipment of supplies, there are two important dividends you may be missing.

FIRST, there's the guarantee. The maker's guarantee you can always get, even if you buy your supplies from a street peddler. But without paying a penny extra, you can be protected by a second guarantee—that of Stromberg-Carlson. Our enormous stake in the independent telephone industry depends on your satisfaction.

Your SECOND dividend will be paid in the next few years as the art of telephony moves forward. A big share of the supply dollars you spend with Stromberg-Carlson go into development of new equipment. We've been head over heels in this industry for over 60 years—both as a source of supplies and as an equipment maker.

Make your supply investment travel farther. If you'd like these 2 dividends, along with the finest supplies available, place your very next order with us.

255 pages of the Stromberg-Carlson Catalog and 4 well-stocked regional warehouses are ready to rush to your rescue when you need supplies. Our picture shows a few of the thousands of items we offer.

STROMBERG-CARLSON COMPANY
A DIVISION OF GENERAL DYNAMICS CORPORATION
ROCHESTER 3, NEW YORK

"We'll be gone all day. We're hiking clear to the next pole!"

It probably won't take those Cub Scouts all day to hike to the next pole, but it is a long way! Those poles are strung with Amertel 135.

When you use Amertel 135 you can space your poles 2½ times as far apart as if you used ordinary BB wire. That means you use fewer poles, less pole hardware . . . you dig fewer holes. Most important, you cut costs on pole installation and maintenance.

Amertel 135 has better voice transmission characteristics, too, and low electrical resistance. We'll be glad to send you more information. Just write American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

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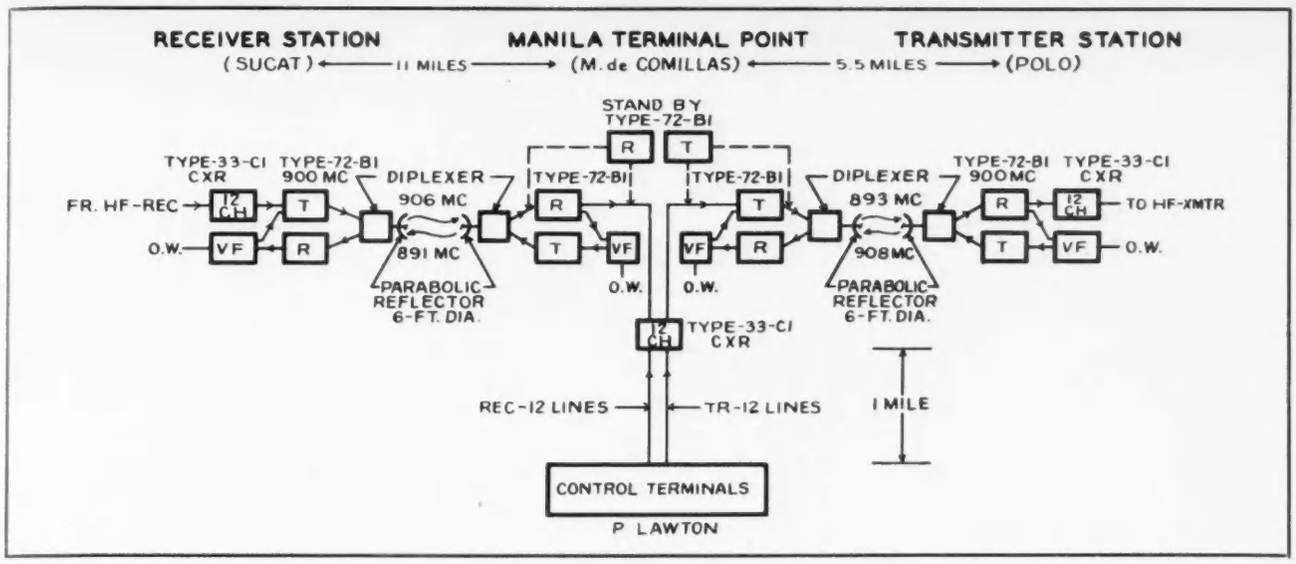


FIGURE ONE: — Schematic diagram, Manila microwave/carrier control system.

Microwave Provides Carrier Control Circuits

in the Philippine Inter-Island Network

By H. E. PRATTE

DEVELOPMENT and use of modern electronic equipment to provide telephone service to a growing island nation has a romantic aura. This has been particularly true in the case of producing telephone communication facilities to serve the Republic of the Philippines.

Located in the Western Pacific, this Republic occupies a relatively small space on the map of the world in comparison to the vast land masses which are in the near vicinity. The 7,083 luxuriant, tropical islands of the Philippines, however, comprise an area of 114,830 square miles, almost as large as the combined area of the British Isles and Japan. Linking together the primary points of trade and commerce of this country has proved to be an exciting challenge to the Philippine Long Distance Telephone Co., which has met the demands for telephone service by the combined use of high frequency and VHF radiotelephone facilities, augmented by land line toll facilities on the major islands of Luzon and Negros.

The Philippine Long Distance Telephone Co., has developed an integrated inter-island network of radiotelephone communication stations which provides the principal arteries for telephone communications throughout the islands.

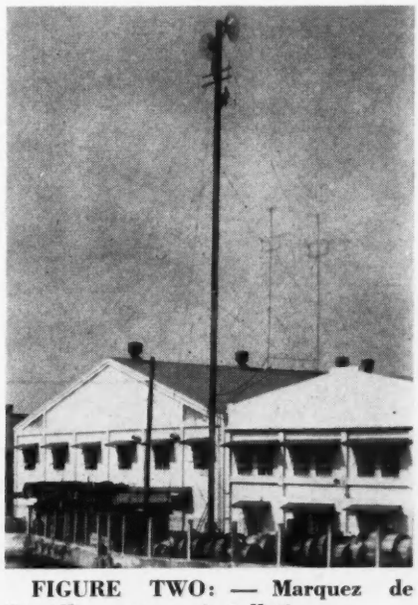


FIGURE TWO: — Marquez de Comillas antenna installation.

The principal lines of communications radiate from the capital at Manila, which is located on the largest island of Luzon. From this point facilities have been established to communicate with the principal trade and commerce centers of the other islands from which come the Philippines' principal products from trade and commerce such as sugar, copra, lumber, iron, copper, gold and other minerals.

These facilities are spread over almost 1,000 miles, from the hemp and lumber plantations of Zamboanga and Davao in the south to the rich mines of northern Luzon.

System Expanded to 17 HF and 34 VHF Stations

PRIOR to 1941 and the outbreak of World War II, a relatively small network from Manila to three principal points in the islands had been established. The system has been expanded since 1947 to a total of 17 HF stations and 34 VHF stations.

The pre-war radio stations in the Manila area were interconnected by

means of open-wire telephone lines to provide the required telephone control lines between the transmitter, receiver and control stations. After the war, which resulted in complete destruction of radio-telephone facilities, service between the stations was established utilizing U. S. Army surplus VHF AN/TRC and CF-1 carrier terminal equipment to link the receiver and transmitter stations to the control station.

These radio carrier facilities were installed between the receiver, control and transmitter stations to furnish control facilities to the remote locations selected for the receiver and transmitter sites. Since these sites were established in areas where security of open wire plant would present a problem, it was evident that radio carrier would provide the most economical and reliable means of communication for control facilities between the operating locations.

Two VHF 4-channel carrier systems operating in the 70-100 mcs frequency range provided control line facilities between the receiver station at Sucat, approximately eleven air-miles south of the city of Manila, and the control station in downtown Manila. Similar facilities linked the control station with the Polo transmitter station approximately five and one-half airline miles north of Manila. Army surplus initially supplied adequate equipment for the system, but as the demands for expansion increased it became necessary to look forward to improved technology and design, and to conservation of radio frequencies to solve the problem of additional control facilities between the radio sites.

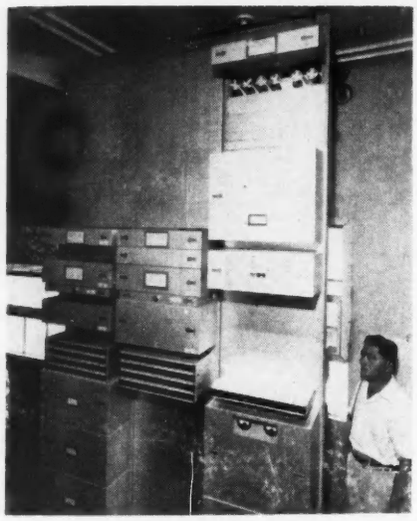


FIGURE THREE: — Sucat receiving station interior showing the Type 72-BI radio equipment and Type 33C carrier equipment.

The Inter-Island System

THE PHILIPPINES are subject to severe changes in weather. Typhoons are prevalent at certain times and this necessitated installation of a radio link that would be least vulnerable to high winds that often play havoc with antenna structures, and cause interruption of service. In addition, a system proved to be least subject to noise disturbances, a major problem in the south Pacific area, would be most desirable.

On the basis of existing problems and both present and future needs, the telephone company's radio engineering staff investigated thoroughly the best means for producing the new facilities required. Their work resulted in the drawing up of plans and specifications for a system which would meet the following objectives:

(1) Equipment operating conservatively in a frequency band relatively free from interference and noise disturbances.

(2) Equipment employing techniques known to the present maintenance staff, offering ease of installation and maintenance.

(3) Equipment offering a minimum of 24-channel capacity on one radio link with possibility of future expansion to 48 channels or more.

FIGURE FOUR: — Sucat receiving station, exterior view. Note parabola antenna.

(4) Equipment operating in a frequency range offering high directivity of transmission thus utilizing high gain parabola antennas and low power output equipment.

(5) Last, but most important of all, the system selected must offer the high reliability expected of the best toll telephone wire line circuits. It was highly desirable that the manufacturer of such equipment be aware of toll telephone transmission problems and offer equipment designed especially for such use.

Lenkurt 72B microwave and 33C telephone carrier were selected to provide the system to meet these objectives. The 72B microwave equipment operates in the 890-960 mc frequency range, and can accommodate up to 72 single sideband, 4-kc spaced

FIGURE FIVE: — Marquez de Comillas installation including operating and standby radio terminals.

voice channels. The type 33C1 telephone carrier used for multiplexing this radio facility provides initially 12 control channels between the operating locations. This carrier equipment can be readily expanded at a future date up to 36 voice channels.

In *Figure* 1, is shown a schematic diagram of the system. Twelve channels are provided from the receiver station at Sucat to the Manila terminal point where the microwave radio and carrier equipment are installed. From here the 12 voice channels from the receiver station are connected by underground cable to the control terminal, about one mile distant. The transmit lines are routed back from the control terminal to the Manila microwave terminal point. Here they are connected to the carrier equipment and microwave radio system which link the control facilities with the HF transmitting station at Polo.

The Manila terminal point is used to obtain the most efficient utilization of the microwave radio system. At this point, the company has installed a 120-foot Truscon steel tower on which the parabola antennas to the receiver and transmitter stations are mounted.

M. de Comillas (Manila terminal point) is located approximately one mile from Plaza Lawton (central terminal) and the two points are connected by means of underground cable facilities. *Figure* 2 shows the installation of the parabola antenna at M. de Comillas.

At the Sucat receiver station, one each Type 72B1 transmitter and one

Please turn to page 71

Meet The Author

HOMER E. PRATTE is general operations supervisor of the Philippine Long Distance Telephone Co.

A graduate of the University of Illinois, Mr. Pratte served during World War II with the Army Signal Corps as a fixed plant communication officer in New Guinea and the Philippines. After leaving the Army, he returned to the Philippines in 1947 as a civilian radio engineer for the U. S. Air Force with responsibilities for planning, installing, operating and maintaining Air Force facilities at Manila, Clark Air Force Base and other installations in the southwest Pacific area.

H. E. PRATTE

In 1948, Mr. Pratte transferred to the Civil Aeronautics Administration to assist in engineering and rehabilitating facilities for that agency in the Philippines. In 1950 he joined the Philippine Long Distance Telephone Co. as a radio engineer, and now is general operations supervisor in charge of radio, traffic, commercial and plant performance.

He is a member of the Philippine Association of Mechanical and Electrical Engineers, and the Institute of Electronics and Communications Engineers of the Philippines.

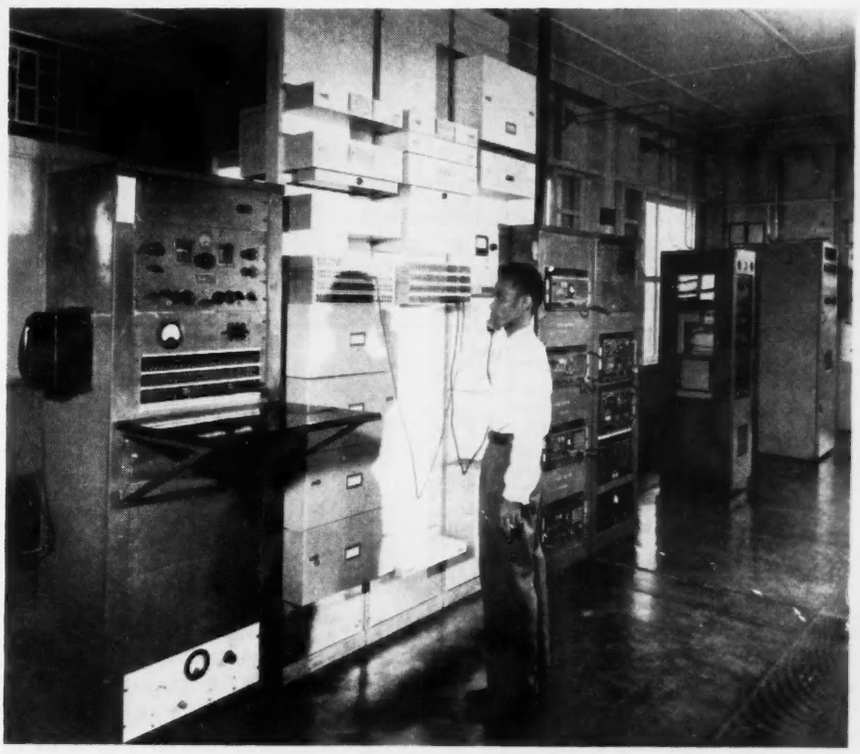
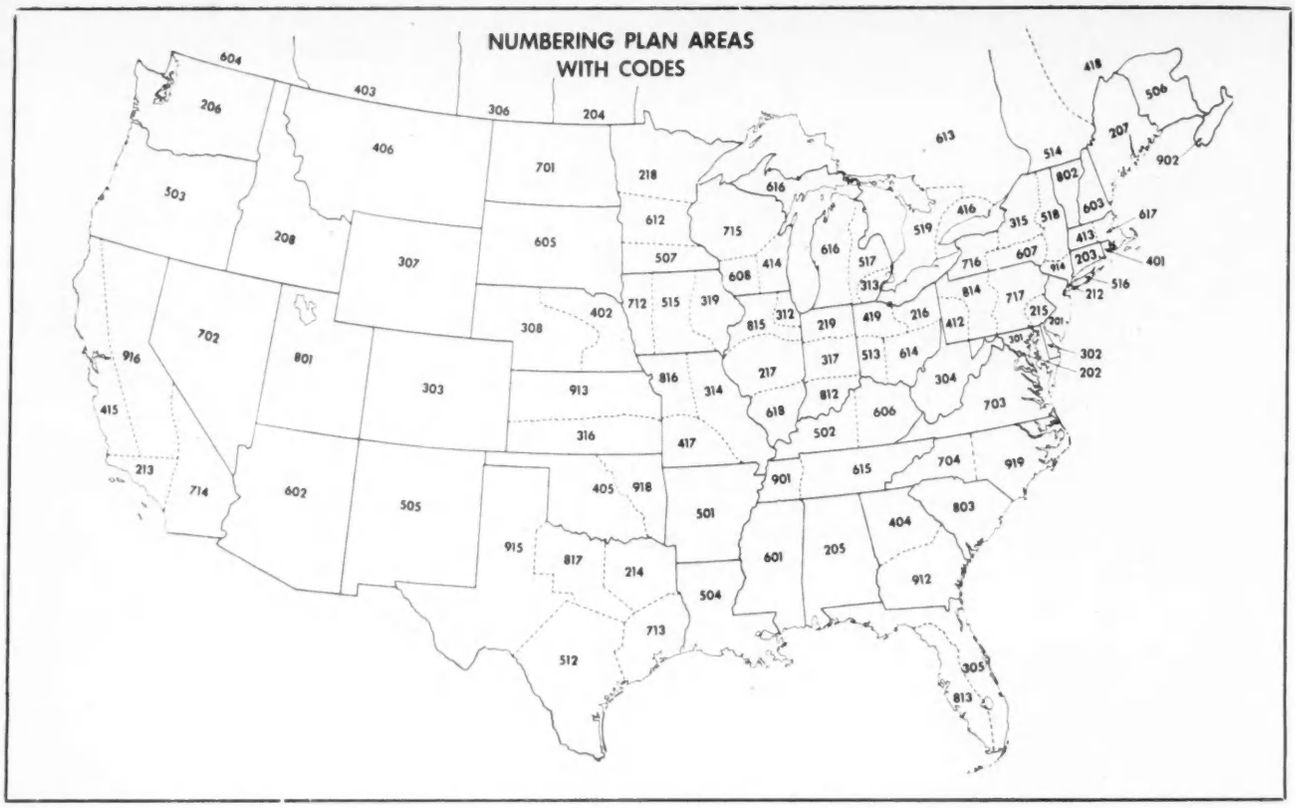


FIGURE SIX: — Polo transmitting station interior.



The Independent Telephone Company

And Nationwide Toll Dialing

By L. A. HODSON

In the concluding section of his article, Mr. Hodson discusses — (a) schedule "A" and "B" compensation; and (b) determining the cost of providing toll service under the nationwide toll dialing plan. Part V of this article appeared in the March issue of "Fortnightly Telephone Engineer."

Part VI — Compensation

TOLL REVENUE comes in three forms:

(1) Schedule "A" Compensation:—

This covers the portions of the costs of local facilities such as land, buildings, central office equipment, distribution cables, open wire and station apparatus, and of accounting, commercial and administrative expenses, which are apportionable to the toll service. With the exception of the costs associated with the toll circuits, all the additional costs which were detailed in article V are chargeable to the "A" compensation.

(2) Schedule "B" Compensation: —

This compensates for the annual charges on the equipment used, and the traffic operating and supervisory expenses incurred, in operating the toll calls to completion. Schedule "B" compensation is retained only by companies which operate all or part of their own toll traffic. Otherwise it is paid to the company which performs the operating function.

(3) Line Haul Pro-Rate: —

This compensates for the use of Independently owned toll lines, terminal equipment, carrier and repeater facilities.

Toll Revenue comes from three sources: —

(a) From traffic between two offices of the same company, passed exclusively over company owned toll lines.

This provides only a small portion of the total toll revenue to the Independent section of the industry. If there is a deficiency in this revenue, it can be corrected by increases in the toll rates between the points con-

cerned. It will not be considered in this article.

(b) From toll settlements with other Independent companies concerning traffic passed over lines owned by the other Independent companies.

This also is a very small part of the total and will also be ignored.

(c) From toll settlements with Bell System companies concerning traffic passed over lines owned by the Bell System.

This is by far the greatest part of the toll traffic, and this article will be restricted to the consideration of revenues from this source.

The toll revenue accruing to an Independent company from the Bell toll settlements depends upon the number of messages completed and the average revenue per message. The schedules incorporated in the traffic agreement between the Independent company and the Bell System company, which translate these factors into cash, have been developed in the past by periodic negotiations based on a limited amount of factual data.

The United States Independent Telephone Association and the Bell System are at present conducting joint studies to place the toll settlements on a more scientific basis. At best, however, the settlements resulting from these studies will be based on the costs of providing toll service in a comparatively small number of offices which were taken to be typical of the Independent section of the industry, at the time the studies were made. In view of the present limited development of nationwide toll dialing with the Independent section of the industry, it would be unwise for any individual company considering providing the equipment necessary for participation in the nationwide toll dialing plan to assume that the considerable additional costs it proposes to incur will be covered by the toll settlements.

Cost Determination

BEFORE PROCEEDING to provide the facilities for participation the Independent company should first determine for its own satisfaction what the costs of providing toll service under the nationwide toll dialing plan would be, using, if not the detailed procedures, at least the principles laid down in the Separations Manual, and compare them with the

With this installment, L. A. HODSON concludes his discussion of "The Independent Telephone Company and Nationwide Toll Dialing." Another series of articles by Mr. Hodson will start in an early issue.

revenues retained under the toll settlements.

If the revenues are sufficient to cover the costs, after giving full consideration to annual charges such as a reasonable return on capital invested, depreciation, obsolescence, maintenance, income taxes, insurance and property taxes on the equipment, land, and buildings employed, and to operating expenses such as administrative, traffic and commercial expenses, rents, gross receipts, franchise and social security taxes, etc., the company can go ahead with its plans. If the revenues are not sufficient to cover the costs the company must consider further whether to participate or not.

Before making a decision on this question the Independent company should first investigate thoroughly the possibilities of reducing the costs of toll operation to bring them into line with toll revenues.

In this respect companies fall roughly into three main categories:—

(A) Companies which do not operate their own toll traffic and which do not own any of the toll lines leading out of their offices.

These companies retain only the "A" compensation portion of the toll revenue. They pay the "B" compensation portion to the Company which operates the traffic, for performing that function. They pay what is left of the toll revenues after the "A" and "B" compensations have been deducted to the company which owns the toll lines, for the use of the toll circuits and distant switching facilities.

Companies in this category, and they form a very large, if not the greatest, part of the Independent section of the industry are hard pressed to find any way to reduce their costs of toll operation. Apart from a general increase in efficiency, which one assumes they are attempting continually without the need for any additional impetus such as is provided by the advent of nation-wide toll dialing, the only specific function which comes easily to mind as offering possibilities of cost reduction is in the conversion of manual billing and accounting procedures to machine.

Many of the companies in this category are so small that machine accounting offers no, or negligible, reduction in costs. In large companies, however, the savings can be considerable.

(B) Companies which do not operate their own toll traffic, but which do own, wholly or in part, some or all of the toll lines leading out of their offices.

These companies retain the "A" compensation portion of the toll revenue, pay the "B" compensation portion to the company which operates the toll traffic, and retain from the remainder of the toll revenue a proportion dependent on the relationship between the toll circuit miles provided by the company and the total toll circuit miles used in extending the calls to their destinations. In addition to any savings which can be effected by companies in category "A", these companies may also be able to reduce the costs per circuit mile of their toll circuits by increased use of carrier and microwave facilities. While the cost reduction consequent upon the use of carrier and, or, microwave may be considerable, it is obvious that such a cost reduction can only be made slowly, and progressively, in the future.

The costs of the existing toll plant cannot be reduced, so that the costs per circuit mile can only be reduced by adding additional circuits, at a lower cost, as they are required by the traffic. That is, while carrier and microwave facilities will enable the company to keep line-haul costs per

circuit mile down in the face of rising traffic volumes in the future, they offer no immediate reduction in the present cost of carrying present traffic.

(C) Companies which operate their own toll traffic and which may or may not own, wholly or in part, some or all of the toll lines leading out of their offices.

These companies retain the "A" compensation portion of the toll revenue for the local plant facilities they provide and the commercial functions they perform, retain the "B" compensation portion of the toll revenue for the operating work they perform, and retain from the remainder of the toll revenue a proportion dependent on the relationship between the toll circuit miles provided by the company and the total toll circuit miles used in extending the calls to their destinations.

In addition to any savings which can be effected by companies in categories A and B, these companies can effect an immediate and considerable reduction in their costs of toll operation by purchasing equipment to give subscriber toll dialing facilities. It is doubtful if there are any companies in this category which could not solve their financial problems of toll operation by the purchase of direct distance dialing equipment.

Furthermore, there appears to be no reason why companies in categories "A" and "B" should not also purchase direct distance dialing equipment, thereby becoming companies in category "C", and solving their financial problems also by this means. Conversely, companies at present in Category "C" can increase their financial problems by passing their toll traffic to a connecting company to be operated, either manually or by the connecting company's direct distance dialing equipment, thereby becoming companies in categories "A" and "B".

It is not proposed to go further, at this point, into the economics of Independent companies providing their own direct distance dialing equipment, as this series of articles will be followed by a further series, entitled "*The Independent Company and Direct Distance Dialing*," in which the matter will be dealt with more fully.

If, as the result of these investigations, the company is able to reduce the costs of providing toll service under nationwide toll dialing conditions to meet the toll revenues it can go ahead with providing the equipment and facilities necessary for participation. If it is not able to reduce its costs the company is still faced with the problem of whether or not to participate.

EDITOR'S NOTE

In answer to the requests of many readers we are considering reprinting Mr. Hodson's articles on "The Independent Company and Nationwide Toll Dialing." If you would like reprints of the entire series (six sections) let us know. Thanks.

In this respect the point of view of the Bell System is given in the preamble to the U.S.I.T.A., Dial Interexchange Committee Technical subcommittee Report of March, 1955, which says:

"*Bell policy reiterates that participation by Independents in the national toll dialing plan is a matter of individual company decision, that companies not wishing to provide the equipment and other features necessary for participation may continue to interchange toll messages on a manual or other suitable basis. This is to say that such expenditure as might be made to arrange an Independent exchange for customer and operator toll dialing shall be borne by the Independent incurring it, except for that portion which might be given consideration in the nationwide toll settlement arrangements or on an individual basis.*"

This may appear reasonable at present but as a statement of policy it should be viewed not only in the light of present circumstances but in the light of probable future developments in the industry. In particular the future provision of direct distance dialing facilities to the Independent company's subscribers should be considered because, whether the facilities be provided by the Independent company or by the Bell system, direct distance dialing will require participation in the nationwide toll dialing plan and the incidental provision of the equipment and facilities for incoming toll traffic described in previous articles in this series.

To an appreciable extent direct distance dialing is already here and its use is being expanded rapidly. Ultimately it will become as normal a part of the telephone system of the country as local dialing is at present. One gains the impression from Bell System speakers and publications that the target date for the provision of all the major switching and traffic carrying facilities is 1965, which is not very far in the future. As additional facilities are provided to increase the number of offices in which it is given and to extend its range, it can be expected that direct distance dialing will be widely and forcibly advertised in order to make full use of these facilities.

The telephone industry appears now to be moving out of its initial stage of development, in which it served a need, into an era in which, in common with other consumer industries, it proposes to create demands. In order to justify the immense initial capital expenditure required to provide the framework for direct distance dialing, it is certain that the full force of the new merchandising techniques being developed within the industry will be used to promote it.

With the widespread circulation of national magazines into every drug and grocery store in the country, and the widespread and ever-increasing coverage of national radio and television networks, it is inevitable that a demand for direct distance dialing will ultimately be created, not only amongst the subscribers of the Bell System Companies, but also amongst the subscribers of all the Independent telephone companies. This demand will have to be satisfied.

There is the further consideration that the Independent telephone companies form an integral and important part of the nation's telephone system. Any plan which purports to be nationwide in its scope must serve

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"Dial Comes To Town"

By RUTH E. RICHARDS

THERE IS AN AIR of expectation, of anticipation, even subdued excitement in your office, for your company is bringing into reality its plans for converting to dial. Possibly a new building is taking on form and substance, and there are strange (strangers, that is) workmen around the building and you hear snatches of talk about new equipment and hear terms that are new to you, such as "line finders" and "connectors." You hear talk of "switches" and "selectors" and of "levels" and it is like a foreign language, or as you might say, "it sounds like Greek to me."

Well-1 yes, it is strange now, but it need not remain a complete mystery, that is if you are interested. Perhaps you will be having some contact with the traffic records connected with dial exchanges, or will be using the equipment after conversion.

There are a number of different types of dial equipment, each type designed to perform its function in accordance with the needs of the company it serves. One type of equipment is termed step-by-step equipment and the following simple explanation of this type of equipment, which is widely used in the Independent industry, may help you to understand how this mechanical genius operates. Comparison:

Manual		Dial
Customer's answering jack	=	Line finder terminal
Answering cord	=	Line finder switch
Calling cord	=	Connector switch
Ringing key	=	Minor switch

To the average telephone woman (not trained in mechanics) a dial switch with the cover removed looks somewhat like a series of semi-circular metal plates about 1/8 inch thick. These plates are piled one upon the other, 10 in number. These plates represent switch levels, numbered from the bottom to the top, 1-2-3-4-5-6-7-8-9-0. There are 10 horizontal stops on each level, I I I I I I I I I I. When activated by the electrical impulses, created by dialing, a small armlike device called a "wiper" climbs to the levels of the digit selected by the dialing customer. (I once heard this operation described as "looking like a mechanical toy monkey climbing a stick.")

Making a Call

A CALL is made in the following general manner: When the receiver is lifted at a dial telephone the customer is connected directly to a first selector through a Line Finder Terminal and Line Finder Switch. Let's say the originating telephone number is "4454." The line finder "picks up" the line number "54" and the calling party receives dial tone (in manual the operator says, "number please"). The party wishes to call 4537. When he pulls the dial (the dial is the means for generating electrical impulses to operate the automatic switches) for the digit 4, the selector mechanism operates to the 4th level and automatically rotates in on that level in search of a point (one of the horizontal stops) to which is attached another switch; dialing the digit 5 causes this switch to operate to the 5th level and rotate until it comes in contact with an idle connector switch. The connector switch will accept the last two digits, the line number 37, and activate the ringing mechanism.

This switching process could be compared to manual operation thus: An operator reaches to the multiple bank and to the line in the particular hundred group with the calling cord; the selectors seek the hundred group (multiple bank) and then the line in the particular hundred group via the

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connector switch. An operator plunges or pulls a ringing key; the minor switch operates.

So-o, your local service will henceforth be mechanical — to a point, but because of the impersonal nature of this self-service method of reaching numbers, on the occasions when a subscriber needs the help of an operator to assist him, you will want this contact to be especially pleasant. Since the average subscriber has fewer calls involving an operator, his opinion of the service and satisfaction with it will depend a great deal on the friendly helpful, personalized manner in which his requests are handled.

Information Service

IN ADDITION to reaching an operator for toll service, customers will call for Information, will reach an operator on an intercepted call, may require assistance in reaching a number or an explanation of how to dial for certain services, as well as requesting help in case of an emergency. Each of these operator services will require some record preparation, and training of personnel to use the records.

There will be a completely new directory at the time of conversion and, of course, all of the numbers will be unfamiliar both to subscribers and operating force. You can, therefore, expect an increase in information calls for a period following conversion — until customers become familiar with the numbers they call most frequently.

To assist operators handling informations calls, it is desirable to have ready reference lists of the most frequently called business firms, the public service companies, fire and police numbers, ambulance services and physicians. In most of our exchanges we provide this information on underglass bulletins at the Information position, with emergency numbers listed at each operators position.

In exchanges serving 6,000 or fewer stations, an "old-new" number list is considered a necessity. This list associates the old manual number and the new dial number, arranged numerically by *old* numbers, set out in hundred groups for easier reference. Several typewritten pages will be required for larger exchanges, which may seem cumbersome, but it provides a means of translating the manual number to the dial number for incoming toll calls and when the name listing is unknown, or not furnished. Such lists should be made up following the initial number assignment and kept up to date up to the time of conversion.

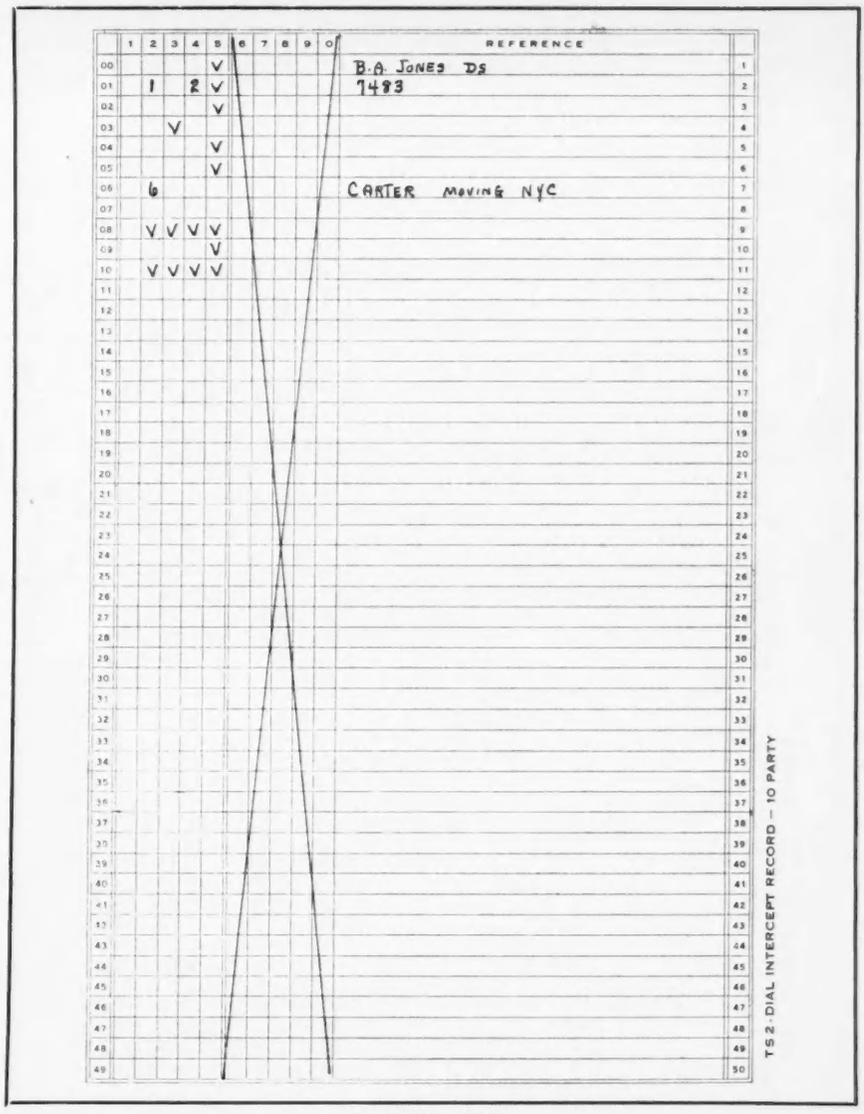

FIGURE ONE

In our company in Illinois we furnish copies of these "old-new" number lists to connecting exchanges in the area around the affected exchange, and we have experienced the finest cooperation in their use for a period of ten days to two weeks following the conversion. Such cooperation lessens the burden of translating numbers by the Information operators and Inward operators.

"Full Intercept" Service

IF "FULL" intercept service is provided, you will receive calls for numbers that are not assigned, if a calling party dials the incorrect number, for numbers that have been changed, disconnected or in some way affected by a non-normal condition. Intercept records indicating the status of each line and station should be provided. Since many dial exchanges serve multi-party lines and the equipment allows assignment on five different frequencies, we use a dial intercept form providing spaces per line to indicate assignments.

If assignments are to be made only on the 1-5 frequencies the 6-0 section is crossed out, or vice versa if the 6-0 portion is to be used. See *Figure* 1. The numeral in the left column on the form indicates the line number in the hundred group indicated on the tab. The numerals above the boxes indicate the ringing frequency, and the reference line numbers are shown at the right side of each line. The line reference number is indicated in the "box" representing the station designation. The letter "V" in a box in-

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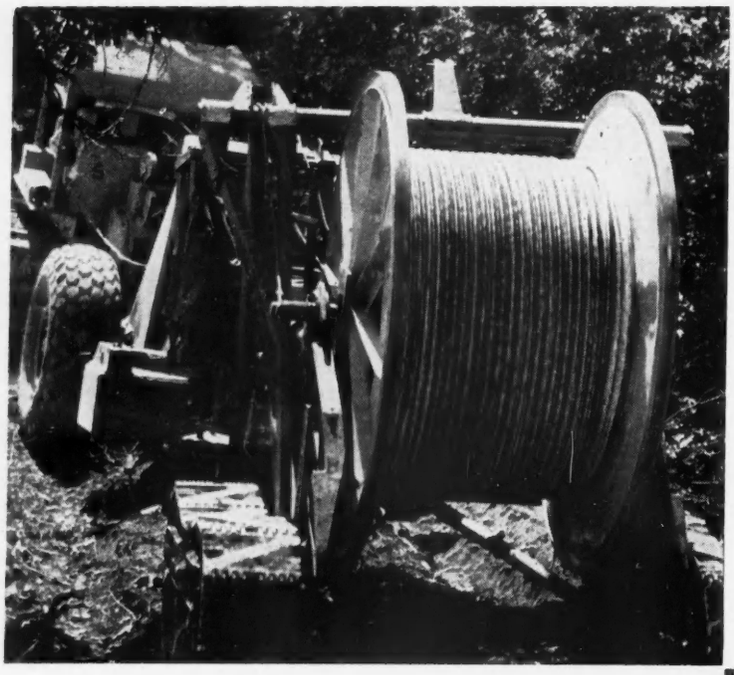
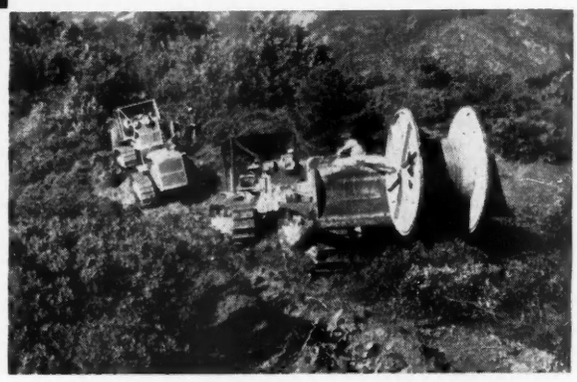


Modern Cable Construction



Section VI-C of Mr. Reed's article discusses the — (1) present practice of attaching cable terminals to the messenger strand, and (2) describes available types of strand mounted terminals.

By JOHN S. REED

Strand Mounted Terminals

CABLE TERMINALS for connecting drop spans from subscriber's residences to pairs in telephone cable have long been mounted on poles in the cable lead. Within recent years many telephone companies have adopted the idea of attaching cable terminals designed for this purpose to the messenger strand instead of to the poles.

Advantages claimed for this method are that better drop distribution is provided with the terminal and drops out of the way on the pole in joint construction with power lines, and that considerably less work is required if the terminal pole has to be replaced, since a strand mounted terminal will not be disturbed by the work operations involved in removing the pole and placing a new one.

With the terminal and drops kept off the pole as illustrated in *Figure* 133, ample clearance is provided for power linemen to climb into the power space above the telephone cable, and the chance of "spurring" the terminal is eliminated.

This section describes available types of strand mounted terminals and methods of mounting them, also methods of running drop wires. into them and connecting the wires.

Cook Electric "Stranterm"

THE COOK Stranterm illustrated in *Figure* 134 is a 11- or 16-pair terminal containing an 11- or 16-pair binding post block in a heavy gauge metal housing with weatherproof hinged cover. The cover is equipped with a quick opening lock. The terminal has embossed Minigap snap-in sockets, spring bronze ground strip, and neoprene self adhering drop wire entrance seals. Another feature of the terminal is an ingenious bell shaped cable nozzle which eliminates cable breakage due to excessive right angle bends.

The binding post block is equipped with a 3½ foot plastic or lead covered cable stub with conductors soldered to heavy Everdur studs embedded in a special unsaturated Polyester thermal setting plastic with fiberglass filler, which is claimed to provide indestructible, moisture-proof gas tight potting of the terminal core. The 11- and 16-pair cable stub and cores are interchangeable in the standard terminal housing. Provision is also made for left or right hand cable entrance into the terminal box.

The Stranterm is also available in 26-pair size with a double faced core equipped with 13 pairs of binding post studs on each side as illustrated in *Figure* 135. The terminal is provided with two covers, one each on the front and back, of the same construction as that employed in 11- and 16-pair Stranterms, and is equipped with a hold-open catch.

Drop wires are dressed and supported by means of three heavy stainless steel wire rings on the rear of 11- or 16-pair terminals, and two on the bottom of the 26-pair terminal described below.

The Cook Stranterm is designed

for use as both a protected or unprotected terminal. It can be fully or partially protected, depending upon the protection requirements of the particular installation. Protection can be provided on a pair-by-pair basis simply by inserting Minigap arresters in the slotted wells provided in the terminal cover as described later.

Although the Cook Stranterm is regularly supplied with 3½ foot stub, terminals can be ordered equipped

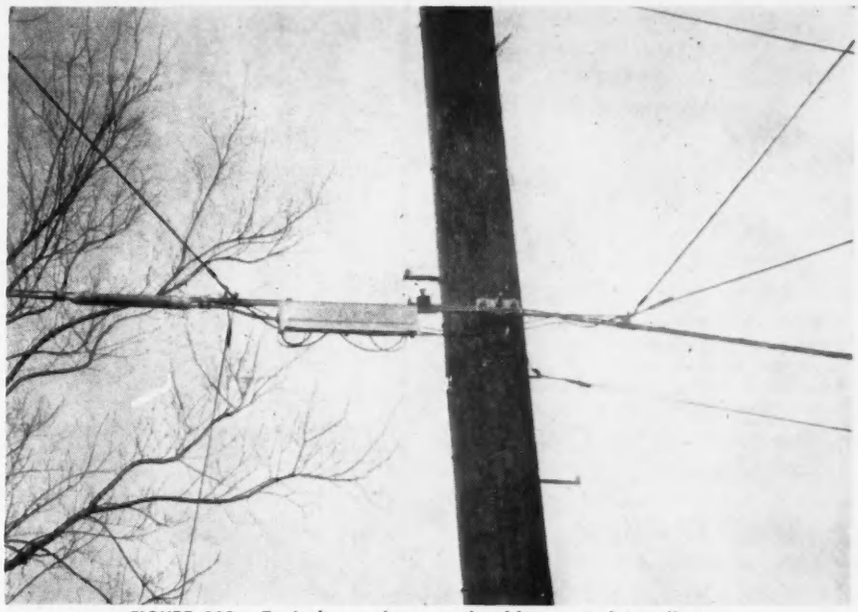


FIGURE 133: Typical strand mounted cable terminal installation.

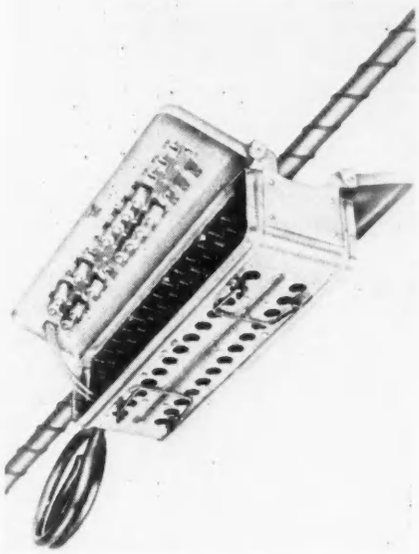


FIGURE 135: — Cook 26-pair "Stranterm" cable terminal. Note double cover construction with hold-open catch.

with a longer stub if it is necessary. The terminal is furnished assembled with stub cable extending to the right when viewing the terminal from the front. Where it is necessary to install the terminal with the stub extending to the left, the binding post chamber is reversed in the following manner:

(1) The rubber insert is removed from the end of the terminal opposite the stub cable, and then the machine screw that secures the binding post chamber to the housing. The binding post chamber is next removed from the terminal housing, and the rubber grommet encircling the stub is withdrawn.

(2) The rubber grommet is inserted in the left end of the housing and the binding post is replaced with the stub extending to the left. It will be necessary to hold the grommet while inserting the cable stub. The machine screw which secures the chamber to the housing is replaced. followed by the rubber insert in the unoccupied cable entrance cutout.

The cover of the terminal is opened by releasing the latches on the bottom of the terminal and pulling it up and out from the terminal housing. On small cable, the terminal should be supported by the hand during this operation.

The cover is closed by pulling it toward the housing with the aid of the cover spring arrangement. The latches are then returned to the closed position.

When the Stranterm is used as a protected terminal, "Minigap" arresters (*Figure* 136) are inserted in

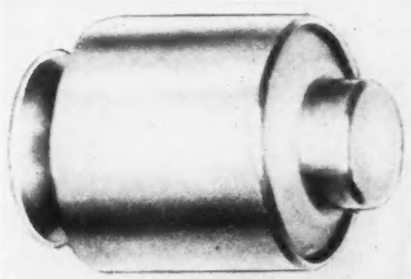


FIGURE 136: — Cook Minigap arrester unit featuring carbon-to-carbon gap, acetate dielectric for instant burnout and self grounding.

the slotted wells provided in the terminal cover. The terminal can be equipped to provide protection for either part or all of the cable pairs in the terminal simply by inserting the required number of "Minigap" arresters (two for each cable pair) to make contact with the pairs requiring protection.

The tool illustrated in *Figure* 137 will facilitate the removal or inser-

FIGURE 137: — Combination socket wrench for inserting or removing Cook Minigap arrester units and connecting drop wires.

tion of Minigap arresters as well as enable the rapid connection of drop wires to binding posts.

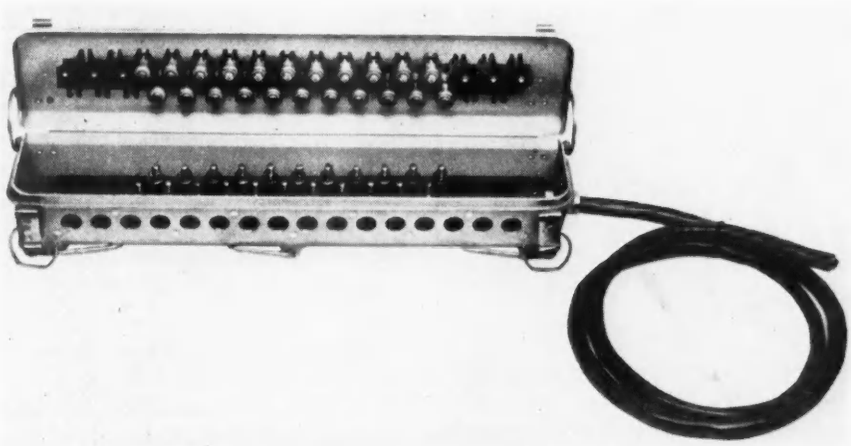


FIGURE 134: — Cook 11-pair "Stranterm" strand mounted cable terminal.

It is of interest to note that the same binding post chamber used in Stranterms are available as 11 or 16 pair units shown in *Figure* 138 for

FIGURE 138: — Cook terminal core with Everdur binding posts for use in Stranterms or as interior cable terminal. The plastic and fiber glass core is provided with a plastic jacketed or lead covered stub.

use as interior unprotected type cable terminals.

Locating and Installing Cook Stranterms

AT INTERMEDIATE cable poles, the terminal is located to the right of the pole with its near end about 10 inches from the cable suspension clamp bolt and the front of the terminal facing on the cable side of the pole as illustrated in *Figure* 139. When the available space be-

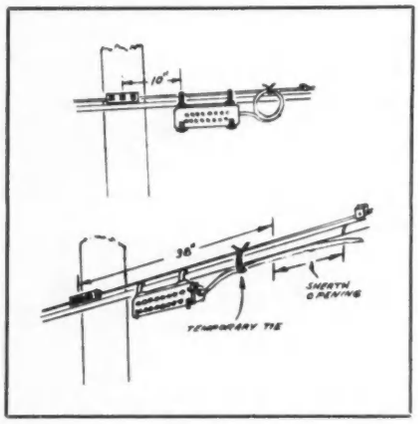


FIGURE 139: — Terminal and sheath opening locations for Cook Stranterm in straight sections of cable leads.

tween the pole and an existing splice will not permit the terminal to be located in this manner, it may be moved closer to the pole with its near end in line with the side of the pole.

Certain conditions may require locating the terminal to the left of the pole, instead of to the right as, when (1) a cable dead end occurs and the cable ends on the left side of the pole, (2) a new terminal splice must be located on the left side of the pole in order to avoid making a four-way joint of an existing splice on the right side of the pole as in *Figure* 140, or (3) an existing splice is to the left of the pole with ample space between pole and splice to accommodate the terminal.

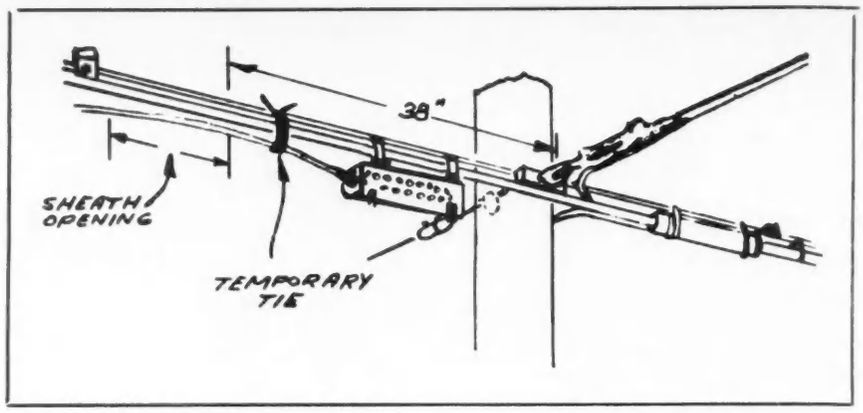


FIGURE 140: — Terminal and sheath opening locations for Cook Stranterm at branch splices in cable.

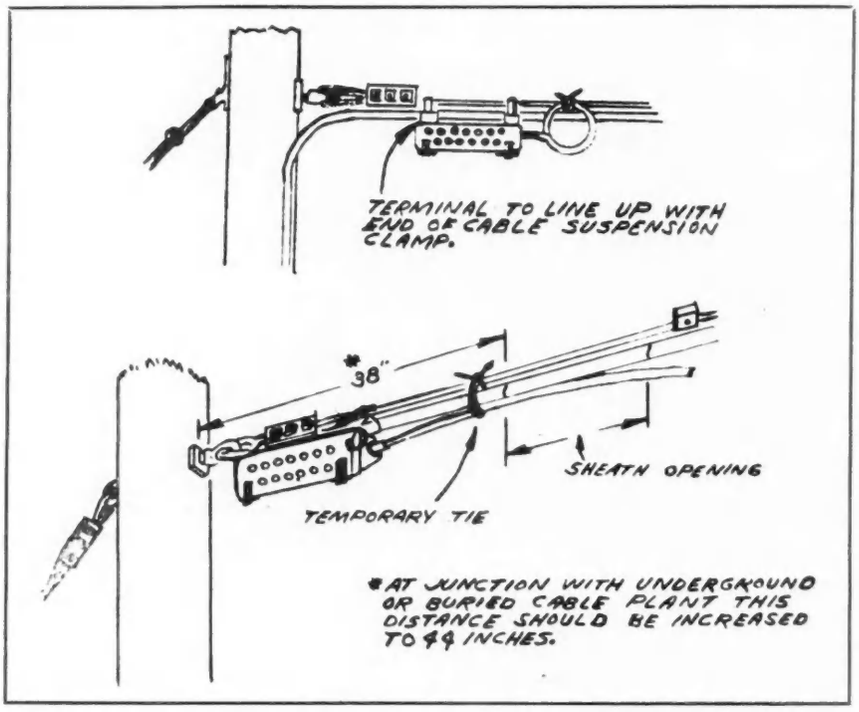

TERMINAL TO LINE UP WITH END OF CABLE SUSPENSION CLAMP.
38"*
SHEATH OPENING
TEMPORARY TIE
*AT JUNCTION WITH UNDERGROUND OR BURIED CABLE PLANT THIS DISTANCE SHOULD BE INCREASED TO 44 INCHES.

FIGURE 141: — Terminal and sheath opening locations for Cook Stranterm at junction with underground cable or at dead ends of aerial cable.

At underground-aerial cable poles and at cable dead-end poles, the terminals are located as shown in *Figure* 141. Where the cable is supported by strand attached to a cable extension arm, the terminal preferably should be placed to the left of the pole with the terminal facing towards the pole, as indicated in *Figure* 142. If an existing splice adjacent to the cable extension fixture interferes with locating the terminal on the left side or there is a lamp bracket or vertical power lead on the same quadrant of the pole toward the preferred terminal location, the terminal should be located on the opposite side of the extension fixture.

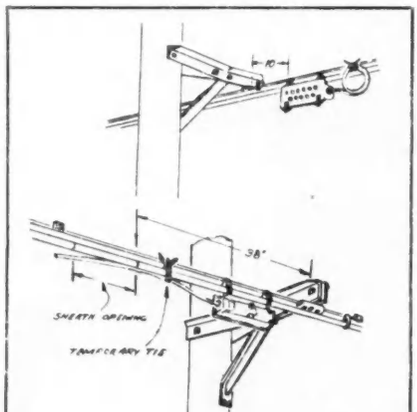


FIGURE 142: — Terminal and sheath opening locations for Cook Stranterm at cable extension arm.

For terminal poles except those at cable ends, the installing procedure is as follows:

(1) The location of the terminal support nearest to the pole is marked with chalk or a narrow strip of fric-

tion tape on the messenger strand. The location of the other terminal support is also marked in the same way.

(2) A ¾-inch cable spacer is centered between the strand and cable under the marker nearest the pole and held in position by two wrappings of marlin or tape around cable and strand adjacent to the spacer, removing the tape marker if tape was used. A second ¾-inch spacer is inserted at the other marker in a similar manner. With small diameter cable, the cable spacer is trimmed so that no part of it extends onto the lower half of the cable, to prevent interference with the placing of the straps.

(3) The buckles are removed from a pair of lashed cable supports (28 inch supports for larger size cables and 22 inch for the smaller cables), and the straps folded in half to obtain double thickness. The closed ends of the folded straps are pinched with pliers and the straps threaded through the slots of the cable spacers and bent over the strand to hang downward.

(4) The bolts of the two terminal clamps are backed off as far as possible without disengaging the nuts. The ends of the straps are drawn together under the cable, inserted into the slots of the terminal clamps, and pulled as tight as possible with pliers. The straps are held in position by bending them upwards against the terminal clamps.

(5) The three inner tails of each strap are cut about ¾ inch from the clamp and the outside tail about 1 inch from the clamp. The outside tail is folded over the ends and back of the other three tails and the assembly pressed against the terminal clamp. Then, while holding the terminal in proper alignment against the bottom of the cable, the bolts of the terminal clamps are tightened. The appearance of the completed job is indicated in *Figure* 143.

For terminal poles at cable ends, the procedure is as follows:

(1) At the points indicated in *Figure* 144, two layers of lead serving tape are wrapped around the strand for the terminal supports.

(2) Buckles are cut off from a pair of 22 inch lashed cable supports and the straps are folded in half to obtain double thickness, and bent over the lead tape wrappings on the strand with the ends hanging down.

(3) The bolts of the terminal clamps are backed off as far as possible without disengaging the nuts. The ends of each strap are drawn together under the strand, inserted into the slots of the terminal clamp, and pulled as tightly as possible with pliers. The straps are temporarily snubbed, while holding the terminal in proper alignment with the strand and tightening the bolts of the terminal clamps. The tails of the straps are then trimmed off.

For installation of the Cook Stranterms on ring supported cables, the procedure at all terminal poles except at cable ends is as follows:

(1) After marking the locations of the terminal supports, the cable is supported from the suspension strand with temporary rings located about 3 inches to the right of the markers.

(2) The straps from two aerial cable supports are cut off about ½ inch from the hinged joint. The hinged end of the hanger is placed on the top side of the cable with the strap loop up and the U shaped wire is wrapped around the suspension strand in the standard manner.

(3) The hanger straps are folded in half so as to obtain double thickness, threaded through the hanger loops, and bent over the cable, with the strap ends hanging down. The procedures of attaching the straps in the terminal clamps and trimming off the surplus ends is the same as described for terminals on lashed cable. The completed assembly is pictured in *Figure* 145.

The method of installing terminal at the end of ring supported cable is the same as for terminals at the ends of lashed cable.

Continued on page 79

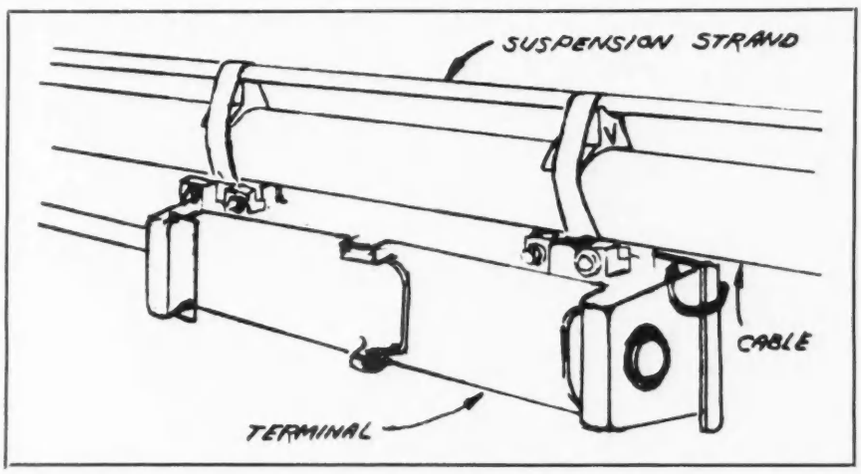


FIGURE 143: — Rear view showing method of mounting Cook Stranterm on messenger strand in straight sections of lashed cable lead.

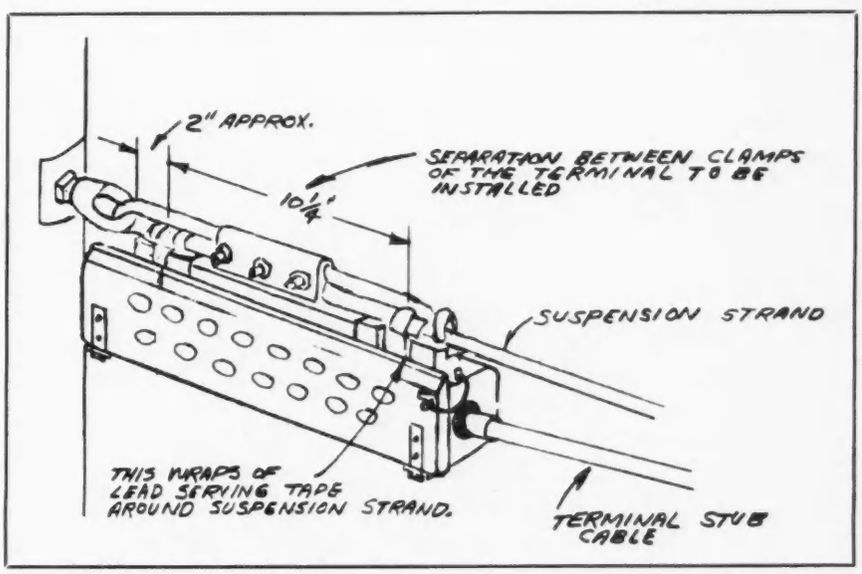

2" APPROX.
SEPARATION BETWEEN CLAMPS OF THE TERMINAL TO BE INSTALLED
10¼"
SUSPENSION STRAND
TWO WRAPS OF LEAD SERVING TAPE AROUND SUSPENSION STRAND.
TERMINAL STUB CABLE

FIGURE 144: — Mounting Cook Stranterm at dead end point in cable lead.

Detached Contact Circuit Diagrams

By R. G. TUNGATE*

THE DETACHED contact method of presenting telephone circuit diagrams reduces the length of connecting lines on the drawing to a minimum and circuit operation is easier to follow.

THE CHIEF requirement of a circuit diagram is that it should present information on the functioning of the apparatus concerned in as simple a manner as possible. The complexity of automatic exchange circuits has made this requirement particularly important, and well-presented diagrams can do much to ease the task of students, maintenance engineers and others who have to refer to them. A little additional time spent in the preparation of a diagram is fully compensated by a saving of time and effort of personnel in the field.

Standard Symbols

IT IS IMPRACTICABLE to represent apparatus and parts of apparatus in detail, and for this reason use is made of standardized symbols for the various circuit elements. In selecting and standardizing symbols the following considerations have to be borne in mind:

(1) The symbols should be self-explanatory and unambiguous.

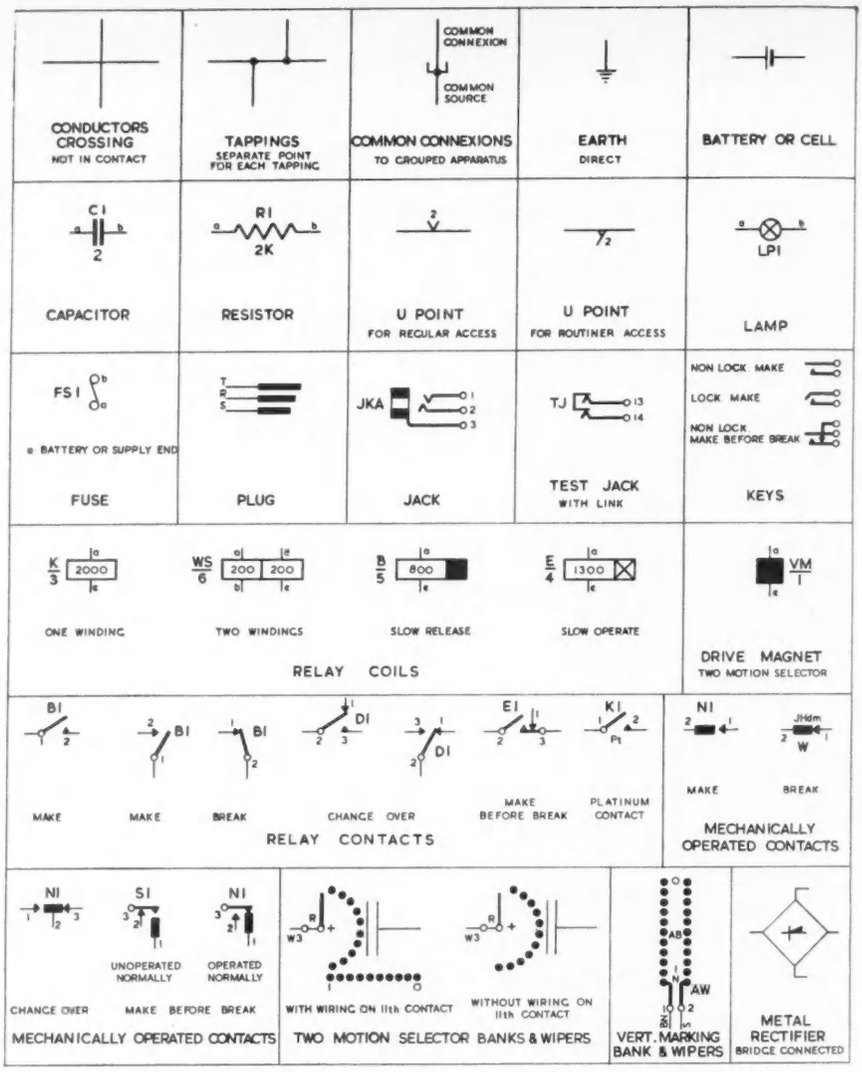


FIGURE ONE.

(2) They should be simple in form to facilitate drawing.

(3) They should show the electrical operation of the circuit. It is unnecessary for the mechanical construction of the component concerned to be shown on the circuit diagram.

Due to the efforts of various national and international organizations, many of the symbols in use in the telecommunications field are recognizable in countries throughout the world. Local variations do, however, still exist and some of the symbols which are in use in Great Britain are given in *Figure* 1.

The Detached Contact System

FOF THE PAST 30 years, the "detached contact" method of presenting telephone circuit diagrams has been in use in Great Britain. In this system, the length of connecting lines on the drawing is reduced to a minimum and the operation of the circuit made easier to follow. Symbols for parts of components, such as relay coils and contacts, are not placed together but are drawn in positions on the diagram relating to their function. Generally, the diagrams show the apparatus in the unoperated position, and as far as possible are drawn so that the main sequence of operation goes from left to right and from top to bottom.

Since various parts of components are shown separated, it is essential that they are coded so that they can be easily recognized. A relay, for example, is designated by a letter and figure e.g. H (over) 3, the letter identifying the relay and the figure showing the total number of contact units. The separate contact units are then indicated H1, H2 and H3. Other items are similarly shown, including keys and their contacts, electromag-

Mr. Tungate is with the Midland Regional Headquarters of the British Post Office specializing in overhead and underground construction methods.

nets and mechanically operated spring sets.

Relay and Component Designations

RELAYS are designated by one or more letters, on a functional basis, and a short selection from the one hundred or so in common use is given in *Table One*. Recognized designations for components other than relays are also in use and typical examples are given in *Table Two*.

TABLE TWO — Component Designations

Component	Designation
Capacitor	C1, C2, etc.
Fuse	FS1, FS2, etc.
Inductor	L1, L2, etc.
Key	K followed by functional code
Lamp	LP1, LP2, etc.
Rectifier (metal)	MR1, MR2, etc.
Resistor	R1, R2, etc.

Figure 2 shows a line finder selector circuit, the operation of which was described in the November, 1952 issue of TELEPHONE ENGINEER & MANAGEMENT. This has been re-drawn by the detached contact method for comparison in *Figure* 3. In order to avoid complications where the "conditional wiring" symbol was used in the original diagram, the re-drawn circuit assumes "C" and "Y" wiring and shows the Busy key wired to *Figure BB*.

A different system of numbering the individual relay springs would be used in Great Britain but, for clarity, the original numbering has been retained in *Figure* 3. It may be of interest to note that the designation "C" would not be used for the Control wire in Great Britain, where this is known as the Private wire and is designated "P."

TABLE ONE — Relay Designations

Function	Designation	Function	Designation
Impulse accepting	A	Rotary hunt control	G
Alarm	AL	Wiper Connecting	H
Guard	B	Bridge Impedance	I
B relief	BA	Meter control	J
Cut off	CO	Cut drive	K
Distributor stepping	DS	Ring or flash	RR
Rotary impulse control	E	Speak	SK
Ring trip	F	Start	ST

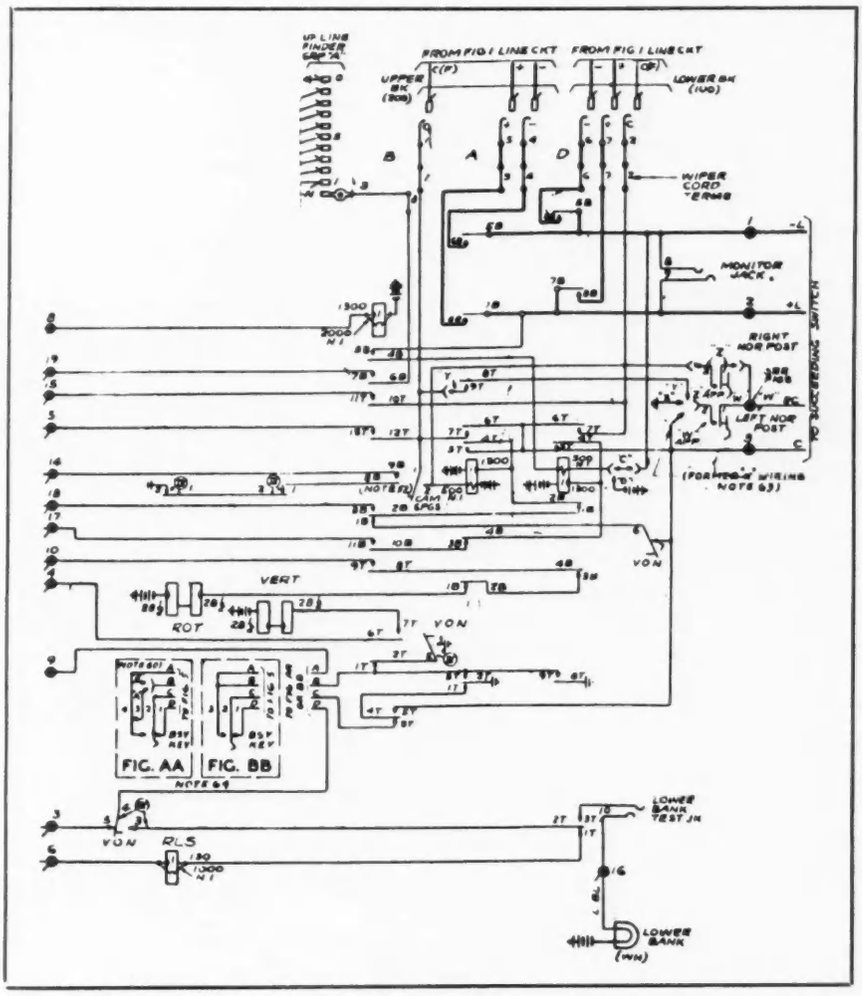


FIGURE TWO.

Wiring Diagrams

IN THE latest circuit diagrams now in use, the actual routing of the wiring between components can be shown, thus avoiding the need for a separate wiring diagram.

A series of designations is entered alongside the connecting lines e.g. R1a — A1 — Be — NR 23 would indicate the wiring runs from the "a" tag of resistor R1, to relay spring A1, to the "e" tag of relay B, and finally to spring number 23 of the rotary off-normal contacts.

Where only three components are involved, an "L" on one of the lines indicates at which point the conductor is looped.

Where a wire merely links together two components, the simple line joining them fully describes the run of the wire and no additional information is necessary. Where the wiring is run as a pair, the wires concerned are shown by ringed figures e.g. 1A and 1B. Such drawings are known as "routed schematic diagrams."

Figure 4 is of this type, and shows a 200 outlet group selector. The selector concerned has no separate release magnet, release being effected by continuing the rotary drive to the equivalent of the twelfth step, whereupon the wiper carriage drops down and around to the home position. The three-coil A relay acts as a tone transformer and enables a balanced dial or busy tone to be fed out to the positive and negative lines. The number of contact units on each mechanically operated spring-set is given in a "box" at the bottom of the diagram, together with the total number of individual springs on the test jack. It is usual to include on the drawing any unused springs or contacts. The routing of the battery and earth wiring, together with the color code of the wire is given on the diagrams.

Conclusion

THE DETACHED contact method of drawing circuit diagrams has stood the test of time, and lends itself

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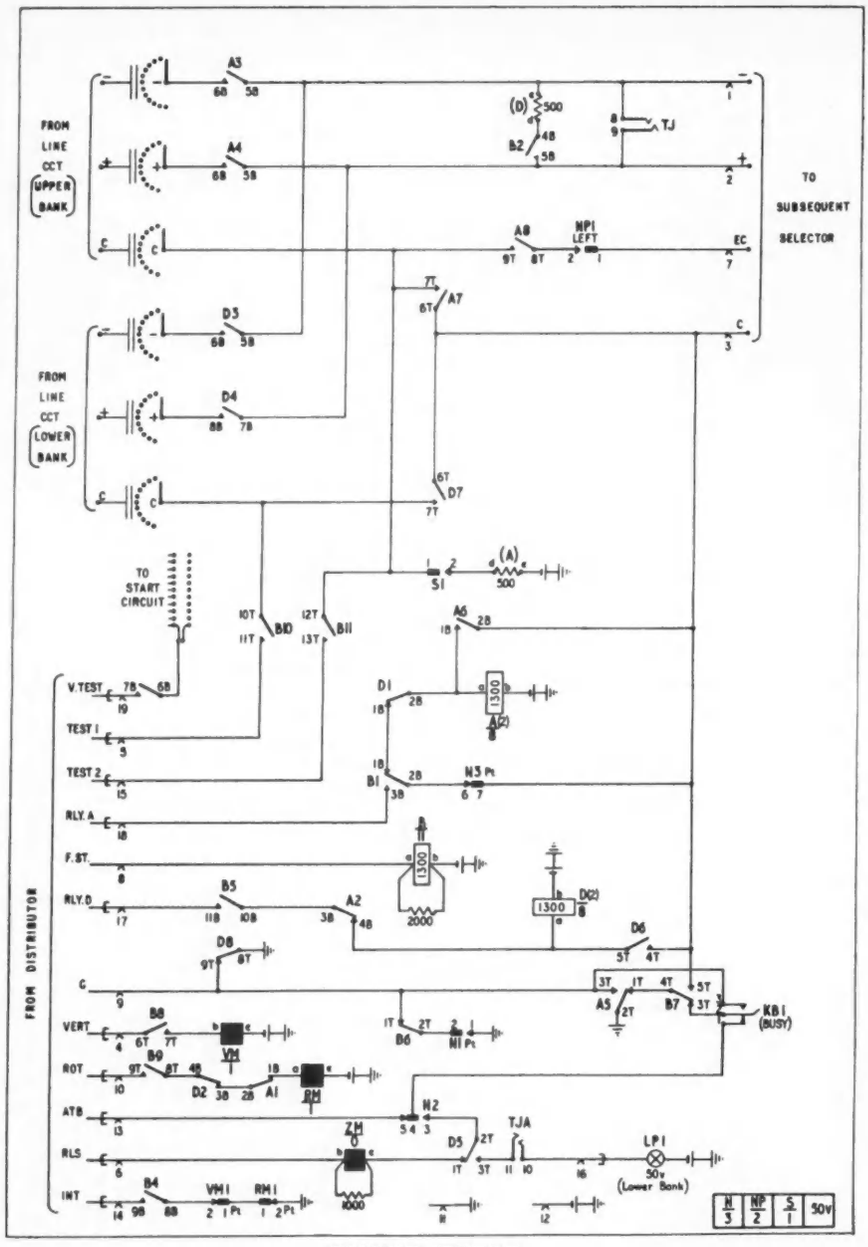

FIGURE THREE.

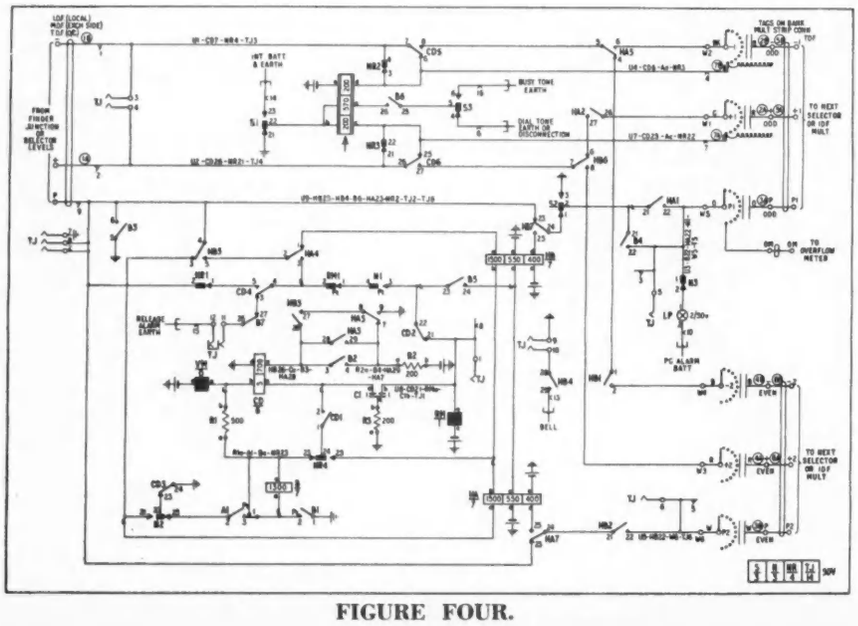

FIGURE FOUR.

to the presentation of large and complicated diagrams of electro-mechanical equipment in a satisfactory way.

The possible application of electronics to telephone switching may open a new phase in telecommunications engineering, however, and make necessary a new approach to the presentation of circuit diagrams. It appears that a development of the detached contact method might form a suitable basis, but in any event it is to be hoped that agreement on symbols for this type of circuit will be reached both nationally and internationally at an early stage, as this would make easier the exchange of ideas between designers of various types of circuit, and simplify the task of future maintenance engineers.

Acknowledgments

THE AUTHOR is indebted to the British Standards Institution and to the Engineer-in-Chief of the British Post Office for permission to include particulars of symbols and circuit diagrams used in the United Kingdom.

—R. G. Tungate.

Book REVIEW

Radio Operating Questions and Answers. By J. L. Hornung and A. A. McKenzie. Published by McGraw-Hill Book Co., 330 W. 42nd St. (Dept. TE&M), New York 36, N. Y. 571 pages, illustrated. Price $4.50.

THIS BOOK (12th edition) is a must for prospective radio operators preparing for FCC License examination. All material contained is in the form of straightforward questions and answers with appropriate illustrations to supplement the text.

New sections have been added, and others revised, to keep pace with FCC's latest Study Guide and Reference Material for Commercial Radio Operators Examinations. Overall more than 1,900 questions cover such topics as frequency modulation, monochrome and color television, radiotelephone and telegraph communication, broadcasting law, transistors, waveguides and reduction of noise.

Aside from being very useful for the FCC examination, this book will also serve as a handy reference for licensed operators or as a text on radio theory and operation. It is of interest to utilities as a text for training operators.

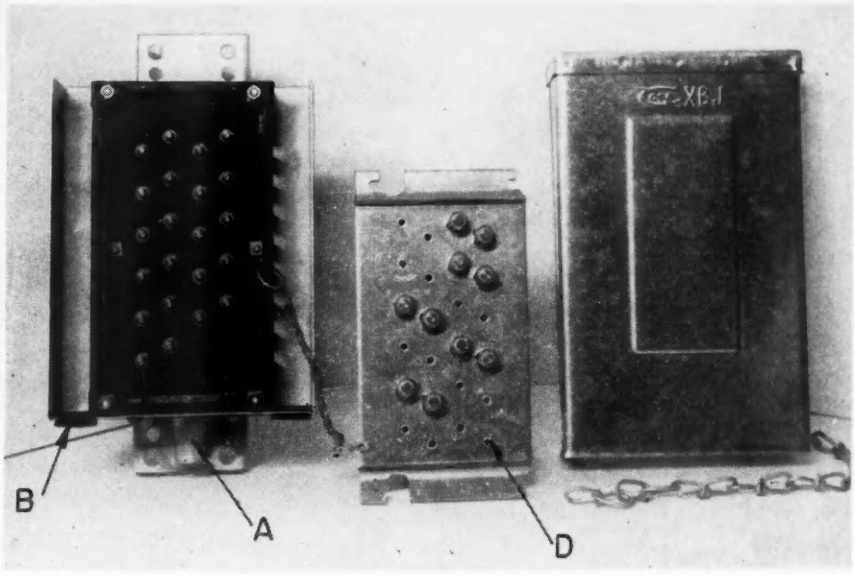

FIGURE ONE

Moisture Control

By J. S. BAKER*

DISCUSSING the joining of lead covered cables with plastic covered cable, Mr. Baker points up the moisture problem and recommends the use of mechanical dams to prevent migration of moisture.

THE USE OF plastic insulated wire and cable is steadily increasing, particularly in less densely populated communities. Generally, we find lead covered cable extending from the central office through the areas of dense population, but in order to use plastic covered cable, it is necessary at some point to join the two types of cable together. It is at this junction point that two difficulties have arisen.

The first is moisture reaching the paper insulated conductors which, of course, results in low insulation and sub-standard transmission. Extensive tests have indicated that the sheath of plastic covered cable allows moist outside air to penetrate until equilibrium is attained between the moisture content of the outside air and the moisture content of the air inside the sheath. This results in dampness in the form of high humidity appearing inside of the cable. Temperature changes then cause the air in the cable to undergo a breathing action which brings humid air from the inside of the plastic cable into the splicing chamber and so into contact with the paper insulation of the lead covered cable.

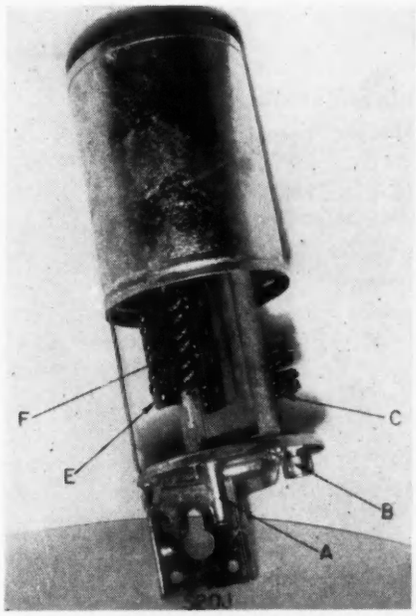

FIGURE TWO: Type S20 J cable terminal.

In order to prevent this migration of moisture, it is desirable to terminate the two cables in separate chambers, the conductors of the cable being joined by a metallic member that passes through the wall of the chamber. In order to provide the operating companies with suitable equipment, we have prepared two mechanical dams and terminals. Both of these terminate the cables in separate chambers, the pairs passing through the chamber wall by a highly insulated stud.

The Type XBJ (*Figure One*) appears in 11, 16 and 26 pair sizes, while the S20J appears in 11, 16, 26 and 51 pair sizes. In both of these dams the lead covered cable is brought in through the well known Cook self-soldering nozzle (indicated at A in *Figure One*) to the inside of the core box where the conductors are terminated on the rear of the terminal studs. After termination, this core box may be completely sealed with cable compound, if desired. In the XBJ plastic covered cable is brought in through a sealing grommet (shown at B in *Figure One*) and

*Mr. Baker is vice president in charge of engineering for the Cook Electric Company, Chicago, Illinois.

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the wires terminated on the terminal studs.

In both the XBJ and S20J the area in which this termination takes place is thoroughly protected from the weather but is not airtight, so that if moisture is breathed in through any cable, there is no tendency for it to accumulate and cause trouble. Relative humidity inside the terminal corresponds rather closely to the humidity outside. There is no possibility of moisture migrating between the pairs of the lead covered and plastic covered cable because the connecting stud passing through the insulating wall of the core box forms a perfect barrier.

The Type S20J (*Figure Two*) provides the same features with the lead covered cable entering the sealed core box through the Cook self-soldering nozzle as shown at A in the photograph. The plastic covered cable enters the terminal through the compression coupling shown at B (*Figure Two*) and terminates on the studs shown at C.

The second difficulty that arises seems to reside in the fact that the dielectric strength of the plastic insulated conductors is very much higher than the paper insulated. As a result the plastic insulated conductors are quite capable of bringing in a voltage wave sufficiently high to instantly rupture the paper insulation.

To protect the paper insulated cable against this condition, the XBJ is equipped with a suitable arrester plate shown at D (*Figure Three*). In this plate are mounted Minigap arresters for the protection of all pairs

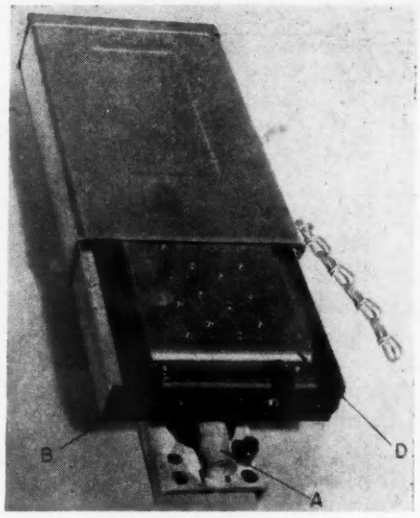


FIGURE THREE: The X B J is equipped with a suitable arrester plate shown at D.

of plastic cable entering the terminal.

It is, therefore, evident that a surge of high voltage travelling in on the plastic insulated cable will find a ready path to ground through the arrester instead of puncturing the insulation on the paper insulated conductors. In the S20J provision is made for protection in the same manner although the type of protection is different in that a fuse is also incorporated in the protector circuit. Primary arresters in series with the fuse are shown at E and secondary arresters in a separate branch path to ground are shown at F. These secondary arresters function should the fuse be blown while the high potential is still on the line. In both of these units provision is made for taking out subscribers drops in the usual manner.—*J. S. Baker*

New Circular Describes Voice Frequency Repeaters

AUTOMATIC ELECTRIC SALES CORP. is distributing a new circular on its AT-2 and AT-3 transistorized, negative impedance voice frequency repeaters which were developed to improve transmission on telephone circuits without using heavier cable, wire or cable loading. The AT-2 is a series type transistorized repeater, and the AT-3 is the shunt type. The shunt type normally is used with the series type and rarely alone, whereas the series type is used extensively by itself.

The circular describes the characteristics of both repeaters and the jobs each will perform in the exchange plant, including how transistorized repeaters can be used on P-B-X tie lines, long tandem trunks, toll completing or tributary trunks, etc. A supplementary technical brochure describes typical applications requiring the AT-2 alone, others where both the AT-2 and AT-3 are required, and still others where negative impedance repeaters are not recommended.

"CM" Pullers

CHISHOLM-MOORE Hoist Division of Columbus McKinnon Chain Corp., Tonawanda, N. Y., has issued Bulletin 146-G on its new, improved "CM" Puller.

Management Discussions

Collected By

MYRLE SHAFER

Responsibility Develops Cost-Conscious Supervisors

NO CORPORATION can expect its supervisors to be concerned with costs or other major organizational goals unless they have some meaningful part in the decision-making activities, says a U. S. university research team reporting to the American Management Association.

Researchers Floyd C. Mann and Howard Baumgartel at the University of Michigan's Survey Research Center say that their findings show how larger areas of responsibility and increased participation in decision-making can result in greater productivity on the part of supervisors. Their results have been published in a booklet called Searchlight on Office Cost Control, number 138, in the office management series of the American Management Association.

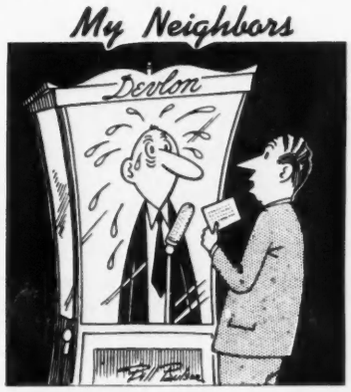
Mann and Baumgartel also found that supervisor concern for costs generally is related to concern for absenteeism. Research done elsewhere shows that where supervisor concern about lost time is evident, there is a sharp reduction in sickness lost time.

Mann and Baumgartel began their study in 1948 in an attempt to discover what office supervisors thought was their responsibility in the complex field of cost control. They learned that supervisors were not equally concerned with costs in spite of a general top management belief that they should be. Even within a single company, there was wide divergence of opinion among supervisors as to their true role in the matter of cost controlling.

It was found that the degree of concern which supervisors showed for costs was related directly to the attitudes and expectations of their superiors. Two other factors were: the amount of "pressure from above" and the amount of responsibility given individual supervisors.

Evidence turned up early in the study to show that of all the supervisors who were "very concerned" with costs, 66 per cent disapproved strongly of absences while among the supervisors who were only "fairly concerned" with costs, only 33 per cent disapproved strongly of absences.

Peculiarly, however, neither type of supervisor was more popular with employes. On the basis that employes under cost control supervisors were neither more nor less satisfied with their working conditions than those under supervisors not "very concerned" with costs, Mann and Baumgartel suggest that keen interest in economy is consistent with good supervisory practice.



"You now have $32,000. Would you care to try for the income tax on $64,000?"

The U. S. researchers suggest that many corporations may be missing out on a good thing by not taking steps to ensure that their supervisors are fully conversant with cost control.

Such a program, however, is not easy to initiate unless it begins with top management. "We predict that a cost concern program would have only minimal effects unless corresponding changes are introduced in the attitudes and actual behavior of the people up the line in an organization," they claim.

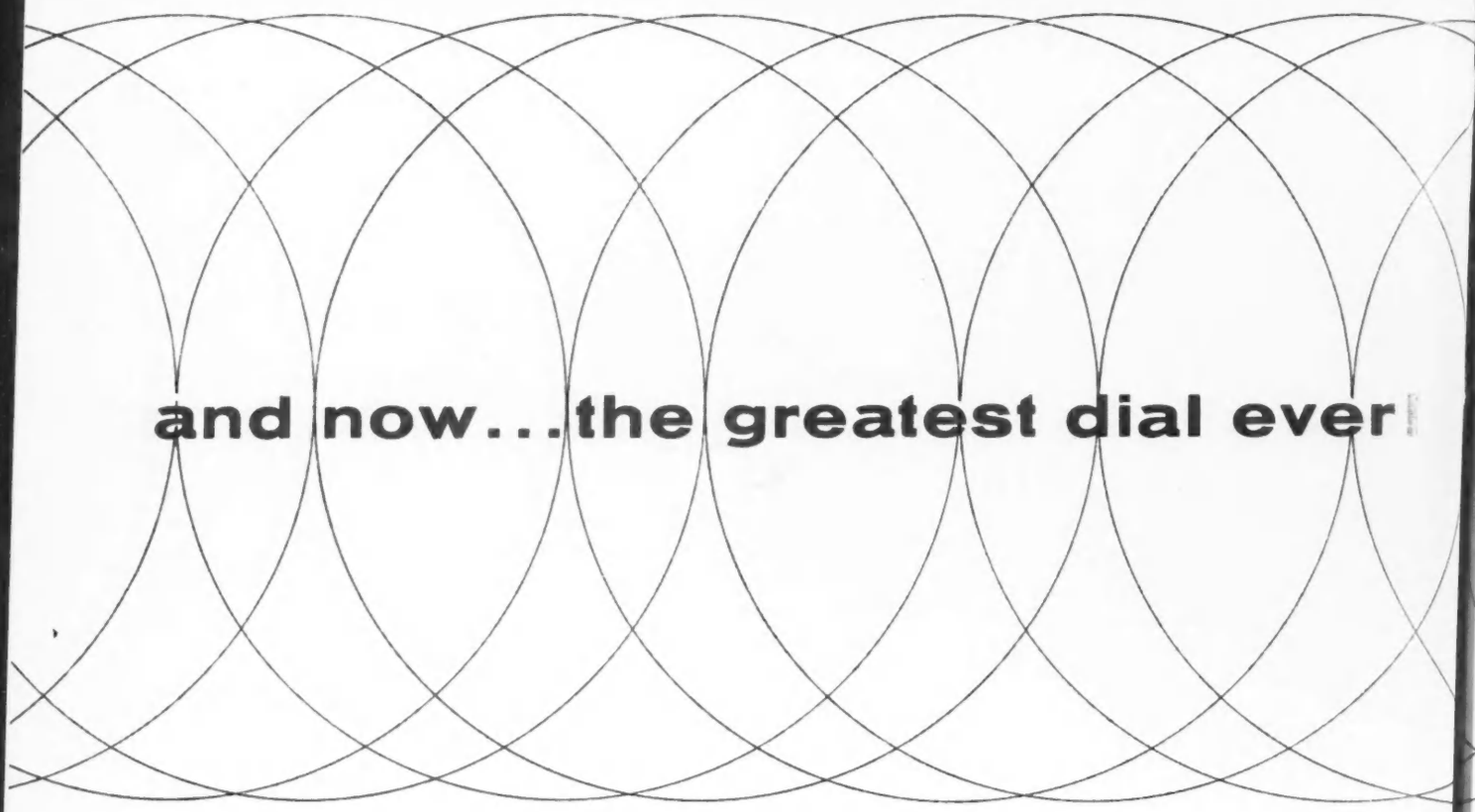
One way of making supervisors more cost conscious, they suggested, was to bring them into budget conferences and to delegate responsibility for costs to them. During their survey, Mann and Baumgartel found that of the supervisors who had much to say in the spending of money budgeted to them, 51% were extra conscious of costs. While, of the supervisors who had very little to say about spending money, only 36% took much of an interest in costs.

They concluded: Corporations anxious to increase their office supervisors' concern with costs must be prepared to give them more say in spending and budgeting.

* * *

The Case Of Henry Gray—Underqualified Supervisor

ONE topic of increasing importance is the training and development of supervisors. The investment itself in supervisor training is a good-sized one, but training of the wrong man can reach phenomenal cost figures for the company concerned. Analysis of the psychological strong and weak points of the potential su-

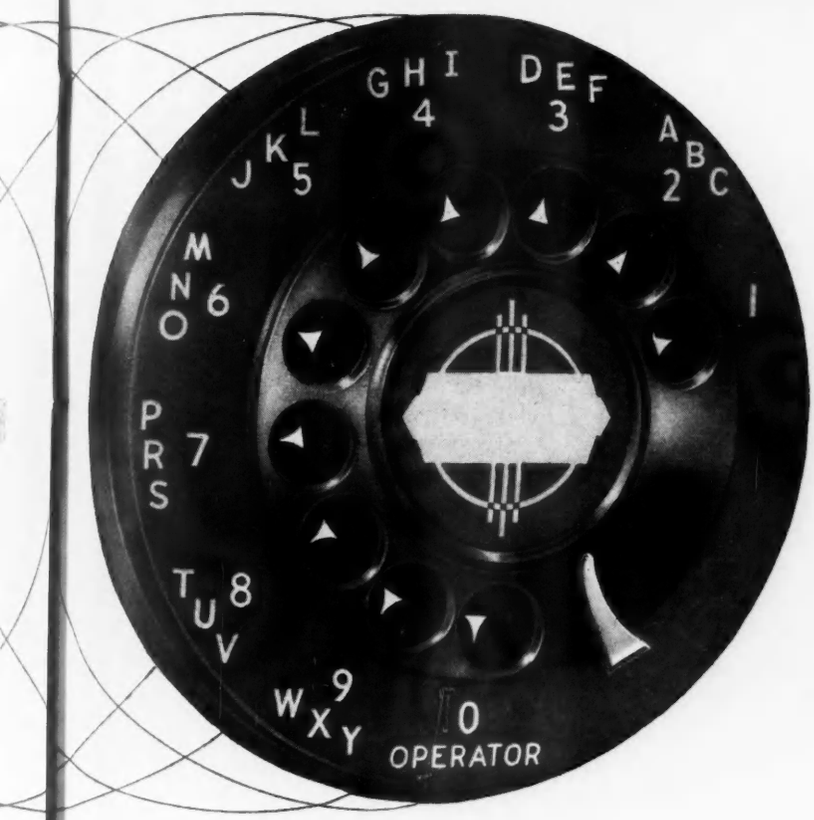


As you standardize on Automatic's new Type 52 Dials, you get long dial life, low dial maintenance. You practically *end dial troubles!* Most dial troubles are caused by wear—and in Type 52, wear is kept down to almost nothing by mirror-finish working parts, precision-cut gears, and a special lubricant. There's no wear at all during wind-up; a silencer holds the pawl clear of the ratchet as the fingerplate is turned.

Specify AK-90 for metropolitan dials, AK-80 for 1-0 dials. Get your order in today! Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

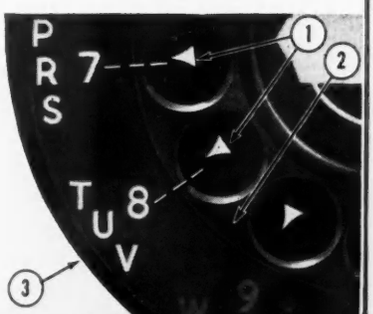
ORIGINATORS OF THE DIAL TELEPHONE



AUTOMATIC'S NEW TYPE 52 DIAL

offers the world's easiest dialing, and even greater dependability. It's standard on Types 80 and 90 Monophones—and is also available for use with other telephones designed for extended number plates.

new ease of use

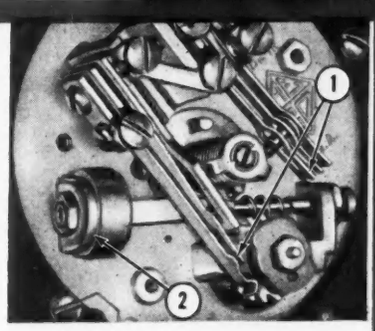


Arrowheads to guide the eye: Arrowheads (1)—most effective device ever developed for pointing direction—guide the eye from fingerplate holes to numbers, help prevent dialing errors.

Clearer vision: Top surface of new, beveled fingerplate (2) slopes toward number plate—affords clear view of arrowheads, even from extreme angles.

New, extended number plate (3): Features easy-to-read, modern figures.

even greater dependability



Twin contacts (1): Reduce many times the possibility of dial failure.

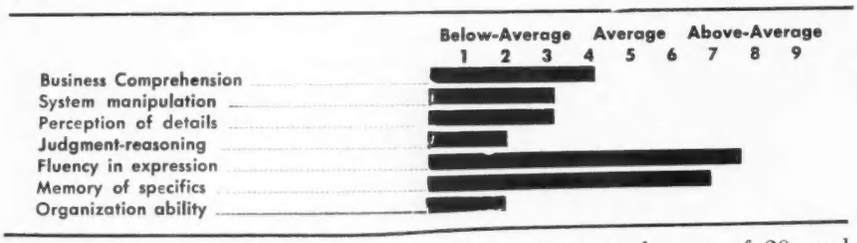
Improved governor (2): Advanced spring design insures even distribution of stresses, cuts wear—guarantees longer dial life, extra freedom from trouble. It also helps assure uniform pulsing.

Dust protection: Opening between numberplate and fingerplate has been reduced to keep out dirt and insects. When used in Types 80 and 90 Monophones, the Type 52 Dial is equipped with a transparent plastic dust cover.

pervisor seems to be an essential first step.

Take the case of Henry Gray—age—50; education—B.A. in liberal arts; marital status—married with three dependents; work history—22 years, with six companies, and job background in general office, sales, and office supervision.

He is applying for a position as office supervisor. In the interview, Mr. Gray showed a good appearance, and satisfactory maturity and stability. He is quite fluent, but not too "quick" in his thinking. His reference checks were satisfactory, but not outstanding. His test scores on the aptitude or intelligence factors are graphed below:



Though he has had eight years experience as an office supervisor, Mr. Gray's aptitudes show some definite weaknesses. He is quite strong on the contact aptitudes (fluency and memory), and his strength in this sales-contact area is backed up by his scores on a personality test. He is below-average (in the lower quarter of the total employed population) in the paperwork aptitudes (systems and perception). His business comprehension is only at the 4 level, and a 6 score is the supervisor requirement. His judgment and organization scores are at the 2 level (in the lower 10 per cent of the employed population), and these are pronounced weaknesses for supervision.

In his overall aptitude pattern, Henry Gray is a UQ (Underqualified) risk, even with his high scores on the contact aptitudes. For such supervisor assignments as department organization, planning, decision-making, business management, adaptability, and even necessary paperwork, Mr. Gray just lacks the basic brainpower to carry out such duties efficiently.

His employe relations would be good as far as the ability to get along with others is concerned; but for such factors as employe development, leadership, training, executive teamwork, he would be questionable. One of his greatest problems in employe relations would be that a good proportion of his workers would be brighter than he, and this can create a very serious morale problem in the employe group.

Mr. Gray hides his lack of ability behind a fluent tongue and a good memory, which gives a flow of words but with little judgment or organization of ideas to back them up. In light of his aptitude weaknesses, Henry Gray is a decided risk for the office supervisor position.

What about hiring Mr. Gray and tailoring a training program for him to correct these aptitude weaknesses?

Training is not going to improve Mr. Gray's aptitude level. The aptitudes mature at the age of 20, and practically no change occurs after that. If Mr. Gray took a supervisory training course, he would lean heavily on his memory, and would accumulate a large storehouse of facts.

However, supervisory knowledge of facts, without the proper application of these facts to operating problems, makes for poor administrative practice. Supervision involves dynamic activity with intelligent foresight and planning and sound judgments; not static reliance on a series of rote-learned principles. The facts are necessary, but are only a means to the supervisory and dynamic.

What can be done about Henry Gray in terms of his proper placement in a job assignment? Gray's test scores point to the sales-contact area as his field of psychological strength. He has the desirable pattern for a fairly routine and repetitive sales job, where demands will not be placed on his intellectual capacities, and where his fluency, memory, and extroverted personality will stand him in good stead.

The case of Henry Gray is a familiar story in business and industry today. It occurs at all job levels, from the rank-and-file to the technical and supervisor classifications.

Underqualification is not always due to lack of aptitudes — the man may have the aptitudes, but lack the personality traits or biographical background to apply his aptitudes properly. In most cases of underqualification, tests show that the person is qualified for some other job area, just as Mr. Gray has definite sales potential but was a supervisor misfit. Retaining a person in a job when he underqualifies is a great waste of manpower for the company.

* * *

"Ivory Tower"

"DON'T IGNORE your *'PO-POOS'*," W. Coles Hudgins told the sixth annual Personnel Forum meeting in Tuscon, Ariz.

The vice president of the Mountain States Telephone & Telegraph Co., Denver, delivering a banquet address at the Arizona Inn, said "*Po-poos* are the promising once, passed over often group of employes."

He told the personnel managers not to forget that group when selecting persons for advancement.

Pointing out that "a good manager is one who gets the most out of his resources," he declared that a good manager is also a person who has "just plain ordinary leadership."

He said assigning employes to "slots" through testing is not enough. "Tests are, at best, only an aid in selecting people. You must know the folks in your organization, what they can do, want to do, their ambitions and desires," he said.

Commenting on the relatively recent upsurge of efforts in industry to establish personnel training and development programs, he said, "We know we've got a problem, but I'm not so sure we know what the problem is."

Too frequently, he said, personnel managers decide what their people need, rather than finding out from them what they feel they need.

"It's like my having 50 hats each size 6⅞, and handing them to 50 of you, telling you to wear them and telling you 'we've decided what's good for you, wear it.' Some of you would look pretty funny wearing a 6⅞ hat."

He said his own firm had made a survey of 400 men in management jobs to find out what training they felt they needed most.

Ninety per cent of them said they had trouble talking to people. "We started a development program based on what they said they needed," he said.

Too often, he said, we fail to do

good because we are afraid of doing some harm.

"It's really a sad situation because there are in my company, and in others, many good people. If not, how would we have become the leading nation in the world? Is it because we have more machinery to produce goods and service?

"I don't think so. It is because we have people with ambition and desire. I think we have done a miserable job of selling to some groups the belief that management today is good management."

* * *

Union Telephone Company Names Personnel Changes

WILLIAM J. HAMM, vice-president and general manager of Union Telephone Co., Owosso, Mich., has made announcement of several personnel changes.

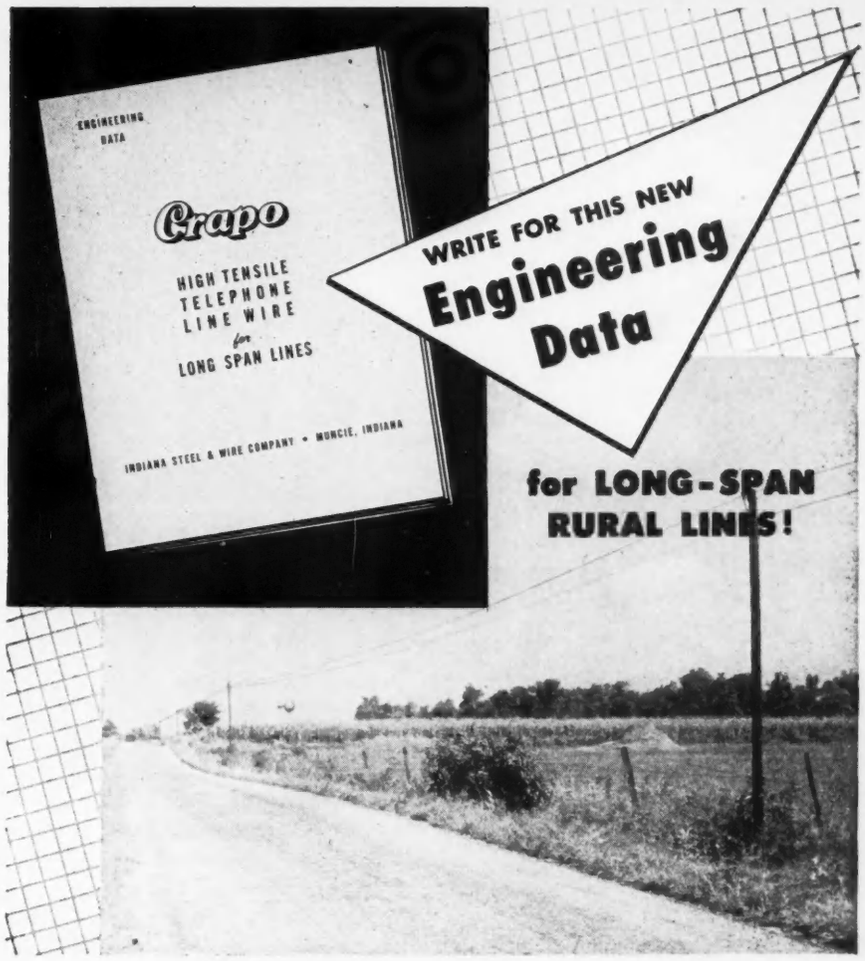
James H. Wiltse, formerly local manager in the Alpena District, was appointed District Manager of the newly established Roscommon District which includes exchanges located at Roscommon, Prudenville, Houghton Lake, Grayling, Gaylord, Vanderbilt, Fairview, Mio and a new exchange to be established in the Summer at Higgins Lake.

William Hoffman, formerly construction foreman, was appointed district plant supervisor for the new Roscommon District. His brother, Albert Hoffman, was promoted to construction foreman.

Mr. Hamm also announced that Edward Zanter, district plant supervisor of the Alpena District, has been appointed district manager of the Alma District. Mr. Zanter replaces James H. Waters who has resigned to accept a position with the Mitchell-Bentley Corp., Owosso.

Charles E. Hines, district plant engineer, has been appointed district plant supervisor, Alpena District, filling the position left by Mr. Zanter's transfer to Alma. Douglas Thompson, formerly combinationman, has been promoted to district plant engineer in the Alpena District.

Lewis P. Thomas, assistant equipment maintenance supervisor, has been appointed equipment maintenance supervisor. Wilford A. Durand, Equipment Maintenance Supervisor, has been appointed equipment engineer. Mr. Thomas and Mr. Durand are employes in the general plant department offices in Owosso.


ENGINEERING DATA
Crapo
HIGH TENSILE TELEPHONE LINE WIRE for LONG SPAN LINES
INDIANA STEEL & WIRE COMPANY • MUNCIE, INDIANA
WRITE FOR THIS NEW
Engineering Data
for LONG-SPAN RURAL LINES!

SPECIFY Crapo HIGH-TENSILE
TELEPHONE LINE WIRE FOR LOWER OVERALL COST

Crapo HTL-85 — For Medium Long Spans

Crapo HTL-135 — For Longer Spans

Crapo HTL-190 — For Extra Long Spans

● FEWER pole structures are required where *Crapo* High-Tensile Line Wire is used in building rural telephone lines. This means substantial savings in time, labor and material. There are fewer holes to dig and poles to set, less material to be handled, installed and connected — all of which contribute to lower overall construction costs.

Crapo High-Tensile Line Wire also makes for lower maintenance costs. Its superior tensile strength offers increased resistance to ice and wind loads . . . provides a greater margin of safety. Heavy galvanized coatings assure dependable, lasting protection.

For maximum savings in the construction and maintenance of rural telephone lines, specify the *Crapo* Telephone Wire which best fits your requirements.

LATEST ENGINEERING DATA, including Stringing Sags and Tensions, Staking Tables and Guying Tables for Heavy, Medium and Light Loading Districts, are now available. Write today for your copy of Data Book No. N-53.

INDIANA
STEEL AND WIRE CO., MUNCIE, IND.

NEW EQUIPMENT *and* NEW METHODS

By John G. Reynolds

- **New Musical Tone Device May Replace Telephone Bell.**
- **Pneumatic Fishline Speeds Cable Fishing Jobs.**
- **Helicopter Used For Defrosting Telephone Lines.**
- **Transparent Film Bags Protect Directories.**

Musical Tone May Replace Familiar Telephone Bell

BELL TELEPHONE LABORATORIES reported recently on experiments with a new musical tone device which may someday replace the telephone bell if it meets technical standards and customers' approval. The first major field trial of the new device will take place in the Crystal Lake, Ill. area. The experimental site was selected for the variety of telephone equipment it affords. Some 300 customers on 100 telephone lines, ranging from individual to 8-party rural service will be asked to participate.

The musical tone equipment uses transistors, the tiny, low-powered devices invented at Bell Laboratories. Transistors are rapidly taking over many functions in telephone communications.

In this experiment the tones will be transmitted with the same amount of power required for a telephone conversation, considerably less than is needed to make a telephone ring. The ordinary telephone bell requires 85 volts; the transistorized device operates on less than a volt.

The experimental telephone sets in Crystal Lake will be almost identical in appearance with the latest models placed in service by the Bell System. The only apparent change in the set is a louvered section at the side of the base through which the sound is radiated. Alterations in the telephone central office at Crystal Lake and on telephone lines there will not affect the customer.

Limited field trials and laboratory tests already indicate some of the advantages of the musical tone. Reactions of a "jury" of men and women participating in laboratory tests showed that the musical tone can be heard at great distances. It stands out above general room noise and can be distinguished from such sounds as the ringing of doorbells, alarm clocks and fire alarms. Still it was judged to be a distinctive and pleasant sound.

* * *

Pneumatic Fishline

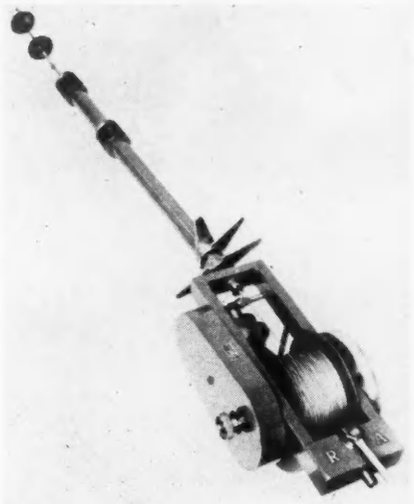
FISHING CABLE and cleaning tools through underground conduit used to be the responsibility of a small, four legged rodent. Now the ferret, who gave its name to a method of

The telephone set displayed above by MARION LAGEDA, an employe of Bell Telephone Laboratories, contains a musical tone device which may someday replace the telephone bell. The new musical tone radiates through the louvered area at the base of the set, emphasized here with a white background for photographic contrast. A full-scale field trial of the new equipment will be made this Spring in Crystal Lake, Ill. area to get technical data and customers' reactions. Using transistors, the musical tone device operates on less than a volt; the ordinary telephone bell requires about 85 volts. Bell Labs' tests show that the tone stands out above general room noise and can be distinguished from such sounds as the ringing of doorbells, alarm clocks and fire alarms.

getting something in or out, has gone the way of the dodo.

A compact, portable, air-operated Pneumatic Fishline (Model A-2, Catalog No. 588), announced by T. J. Cope, Inc., makes it possible to fish cable through underground conduits of any diameter or length in minutes instead of hours.

Installation is simple; operation rapid. A specially-designed flexible steel cable is shot through the conduit to the "target" manhole. Once the



Pneumatic Fishline makes it possible to pull cable through underground conduits in minutes.

manhole is reached, the propellant air is turned off and the projectile removed, and for it is substituted simple cleaning tools and the pulling wire or cable.

Then with only a quarter turn on the Fishline clutch knob, a powerful air motor is engaged through reduction gears to the Fishline reel. A flick of the control valve starts the motor, and the line with its newly attached accessories is quickly retrieved through the duct and re-reeled for its next application.

The Neoprene cups offer excellent resistance to wear and to the effects of sunlight, water, oil,etc. Yet they are sufficiently flexible to insure a snug fit with the ducts. They are available in a range of sizes to fit up to 10 inch pipe.

A hand operated fishline, also available, successfully reduces rodding costs.

* * *

'Copter Tried In Defrosting Telephone Lines

A HELICOPTER blew frost from 60 miles of telephone lines recently, but

ALPHADUCT DROP WIRE
carton packaging
saves you time and money

- easier to handle
- easier to inventory
- stacks neatly, saves space
- saves workmen from injury
- prevents wire from being crushed

Once you start using Alphaduct Drop Wire you will find out that the handy carton packaging has real dollars and cents advantages.

Not only does your wire arrive in perfect condition, but the sturdy carton protects it all the while it's in your warehouse.

The cartons are easier to handle than loose coils. They can be stacked higher without danger of falling and the wire on the bottom will not be crushed or bent. Space is saved, inventory taking is simplified, and the possibility of injuries to workers from tumbling coils is removed.

We try to make Alphaduct the finest, longest lasting drop wire money can buy. Quality materials are used throughout, step-testing during every phase of manufacture assures uniform high standards. Alphaduct drop wire is dated with a color coded thread so you can tell for sure how long it lasts.

Try Alphaduct Drop Wire

ALPHADUCT WIRE AND CABLE COMPANY • MILLTOWN, NEW JERSEY
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REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO., CHARLOTTESVILLE, VA.
THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

Getting Together Across the Miles

Everyone agrees the telephone is valuable in emergencies. But too often its social benefits are taken for granted.

The advertisement on the opposite page points out how the telephone contributes to happiness. Millions of readers of March magazines, in areas served by all of America's telephone companies, will see this ad, and be reminded of the friendly benefits of telephone service . . . the fact that it provides a warm and personal way for people to get together though miles apart.

"I miss you"

"Good to hear your voice"

"Welcome Home"

"Happy Birthday"

"See you this evening"

These simple, friendly words are said many, many times over the telephone each day.

It is just such simple, friendly words from one person to another that make the telephone such an important part of our lives.

Surely it is indispensable in emergencies. But its greater value may be in carrying friendship and love and happiness across the miles.

For without the telephone, time and space would rush between us. And many of us would be so much alone.

BELL TELEPHONE SYSTEM

Suttle Brings You Many Plus Values

Keystone Wires

The Telephone Wire That Stays Up A Few Years Longer

Keystone steel telephone wire is just the same as any other good quality wire of its kind, except that it is galvanized in a little different manner. This different method provides an exceptionally pure coating of zinc, and it allows the coating to be a little thicker because it is drawn out of the zinc bath vertically.

These plus qualities make the coating last a few years longer to give you a lower cost in the long run. It is just one of the many plus values you get from Suttle.

Regular BB
High Strength 85
Extra High Strength 135

See Your SUTTLE Catalog

Serving Independent Telephone Men Since 1910

Suttle EQUIPMENT CO.

LAWRENCEVILLE ILLINOIS

an official of the Alberta Government Telephones said results of the experiment were difficult to determine.

The machine took about four hours to fly from Edmonton to Ponoka, the downdraft from its rotor blades blowing the frost off lines and poles. The helicopter flew about 20 feet above the wires.

The experiment was tried in an effort to restore normal telephone service between Edmonton, Calgary, and other points in southern Alberta.

However, the AGT official said it was difficult to assess the helicopter's work. He said some improvement was noted soon after the machine started flying along the line. But the sun also was melting some of the frost then.

Directory Protection

GREATER BOSTON area telephone directories for 1956 were left on the doorstep in transparent film bags made of Bakelite polyethylene, if no one answered the delivery man's knock and there was no sheltered place he could leave the book. The reusable bag protects the book from the weather until the householder returns.

Film made of Bakelite polyethylene was an obvious choice for this protective job because it sheds water readily and because it retains its flexibility and other qualities even at subfreezing temperatures.

New England Telephone & Telegraph Co., one of the pioneers in this new service to telephone subscribers, ran trials last summer in four New England cities before tackling the Greater Boston job. The trials confirmed that roughly one directory in 50 needed a bag because it had to be left in an unsheltered place. This is a small percentage, but a bothersome one. A damaged or soaked directory is useless and annoying to the customer. Replacement and redelivery, particularly in outlying areas, can be expensive for the company.

The handy film bags also help to promote good will. During a trial in the Providence-Pawtucket (R. I.) area, the company made a follow-up survey among subscribers whose directories had been delivered in polyethylene bags. Many subscribers mentioned that their books had remained outdoors for two or three days and more without damage. A majority of the customers said that they were reusing the large bags for storing food, clothing, and miscellaneous household items. About 1,750,000 directories were delivered in the Greater Boston area during the end of 1955. About 50,000 bags were used, mostly in outlying areas where the metropolitan directory is delivered in the same bag with the local suburban book.

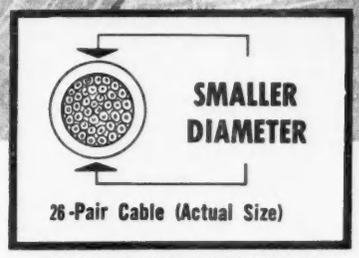
Experience

It takes a lot of time to get experience and once you have it you ought to go on using it.—BENJAMIN M. DUGGAR.

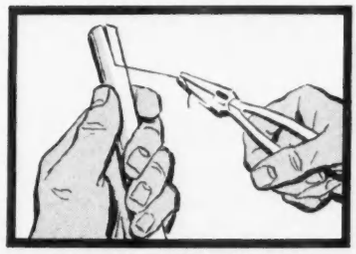
Transparent film bag protects directory from the weather. Bags were used by New England Tel. & Tel. Co.

Your needs designed this **Ankoseal**® INTERCOM CABLE

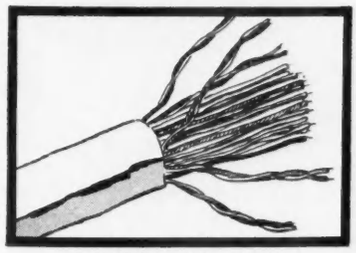
SMALLER DIAMETER, LOWER COST, FASTER INSTALLATION



BULKINESS REDUCED!



FASTER STRIPPING!



COLOR CODING!

Ankoseal inside wiring cable has been redesigned with smaller diameters, and features that make for easier installation at lower cost. The result is an intercom cable with exceptional advantages:

1. *Substantially reduced diameters . .* 2. *Steel rip-wire built in to speed stripping . .* 3. *Full color coding to identify each pair . .* 4. *Worthwhile cost savings.*

Available with 6 to 51 pairs of solid, soft copper conductors, in 22 or 24 gauge. PVC insulation and brown jacket. (Ivory jacket also available on special order.)

·ANSONIA·
Ankoseal®
'The first all-plastic cable'

THE ANSONIA WIRE & CABLE COMPANY • ANSONIA, CONNECTICUT

Questions and ANSWERS

Conducted by Jay G. Mitchell

In this issue of his popular department, Mr. Mitchell discusses —(1) formula for testing dry cell batteries, and (2) explains the necessity for ringers of varied capacities.

Question: — *I have searched my files in vain for formula to use in testing dry cell batteries used in magneto telephones. This group of companies still has a few magneto exchanges and many, many magneto rural subscribers. An effective way for plant men to determine whether the batteries should be replaced or not would net quite a saving to this company each year. One method that I cannot clearly remember was using a 3-volt meter with a fixed resistance and parallel connecting across the dry cells; if the voltage remains constant for a certain period of time, the batteries were determined to be good.*

Another method which I have also forgotten the details, is to connect a 3-volt meter across the dry cells and after raising the receiver, certain voltage must be maintained for a certain period of time before the batteries were pronounced good.

I would appreciate it very much if you would provide me with the method you believe to be proper. Enclosed you will find a stamped, self-addressed envelope for your convenience. We wish to thank you in advance for your assisting us in this problem.

Answer: — The reply to this constructive inquiry has been delayed because of a delay in transit of the letter in which it was set out. However the inquiry sets out a question of the greatest importance to telephone companies that are supplying service to stations equipped with magneto local battery telephones. It is, of course, reasonable to conclude that the batteries in a given telephone are ready to be renewed when the telephone is frequently reported as being "faint." In the long past, when practically all telephone instruments were local battery equipped, the troubleman received the report of "faint" very often. It is also to be remembered that the telephone stations in a magneto system which are in use the most (handle the greatest number of calls both incoming and outgoing) or which handle the extremely long lasting calls, make the greatest demands on the capacity of the dry cell battery.

Therefore if the telephone instrument is in good order, induction coil undamaged, wiring of the instrument itself, in good order, receiver cord undamaged and transmitter undamaged; and the telephone is "faint" it goes without saying that the battery is, in all probability, exhausted. Under these conditions it is the opinion of QUESTIONS AND ANSWERS that the battery, with the receiver off the hook for five minutes period of waiting and still off, should show a voltage of at least 0.85 volt per cell or 1.70 volts for the battery. This voltage reading should be taken with a good quality high resistance voltmeter.

In telephone exchanges serving a large number of rural telephones some companies have found it to be economical to send out a truck with a barrel of new batteries and to renew all rural telephone dry cells which indicated less than 0.9 volts per cell on the five minute test load described above. Such batteries can often be used in telephones in town which are carrying a light load of traffic. The point is that it is very expensive to send new batteries to distant rural stations especially in the winter but that town stations are more accessible and the troubleman can test their batteries at a lesser cost in time than the distant rural stations. It is also true that the light loaded stations in town can get considerable service from the partially exhausted dry cells which have been retired from the rural telephones on the suggested trip in the fall.

If your inquiry was not understood please write again. If you are purchasing large quantities of dry cells and wish to make your own qualifying tests of the several kinds a systematic method of testing samples might be of service.

Question: — *The latest practice in party line ringing is the Decimonic series of* 20-30-40-50 *and* 60 *cycles with high impedance coils having a resistance of* 2,000 *ohms each coil or* 4,000 *ohms for the two coils. We find that the condensers recommended to be used with this type of ringer vary with the frequency. As an example, a* 20 *cycle ringer is listed as* 0.5 *M. F., a* 40 *cycle as* 0.11 *M. F., and a* 60 *cycle as* 0.06 *M. F. capacity.*

Can you explain the necessity of the varied capacities? The 40, 50 *and* 60 *cycle ringers appear to respond the same with a* 2.0 *M. F. condenser as they do with the condensers specified by the manufacturers.*

Answer: — This interesting question takes QUESTIONS AND ANSWERS back many years to the time when the late W. W. Dean developed the harmonic frequency selective party line system. This system became very popular and had many advantages over any of the selective party line systems that had been available before it.

In the Harmonic party line selec-

tive calling system frequencies of 16.6, 33.3, 50.0, and 66.6 cycles per second were used. The ringers for the four parties on one selective party line telephone circuit were so constructed as to be *mechanically attuned* to their certain frequency. This mechanical tuning was accomplished by the use of several different weights of clapper each of which struck their own gong when actuated by their individual frequency of ringing current.

In addition to the use of selectively attuned clappers the several selective party line ringers were wound to varying impedances. This distinctive impedance was obtained by the use of windings on the ringer actuating spools which were designed to be effectively operative at their rated frequency only.

When four ringers, one for each frequency of ringing current, were bridged on the common telephone circuit, only one would be actuated by one of the four selective ringing currents from the central office sufficiently and regularly to strike its gong. The clappers of the other telephones on the same circuit would be slightly moved but irregularly and not with sufficient force, owing to the mechanical and electrical tuning, to strike their gong and attract the attention of the called party.

The winding of the ringer spools to different impedances adapted them, in addition to the mechanical tuning by different weights of clapper, to selectivity as to the frequency of the ringing current, for illustration, impressed on the four party telephone circuit.

In other words the 16.6 cycle ringer offered such a high impedance to the 33.3-50.0-66.6 cycle ringing current that it did not effectively strike its gong although it slightly and irregularly may have been vibrated. All the four frequency ringers, however, were wound to present a *very high impedance* to the voice carrying currents normally on the line during conversation. This effectively prevented serious transmission losses although all the party line ringers were bridged across the telephone circuit at all times.

In any frequency selective calling system the ringer circuit is normally bridged across the line at all times when any one of the party line telephone stations is being called. It is necessary, therefore, in any such system to vary the impedance of the ringer circuits so that each party line telephone can respond by effective operation of its ringer to only one of the possible frequencies used for ringing subscribers bells.

The impedance of *all* the connected selective party line ringers must be kept at a value which will prevent any serious loss in transmission due to the shunting of the telephone line by the connected ringers. It is quite possible that the use of the same coils in the ringers of all four or five parties has certain manufacturing advantages providing enough variation can be introduced into the impedance of the ringer circuits by the use of different condensers.

In the original frequency selective systems the different stations were mechanically attuned, as has been shown, and the electrical impedance of each of the ringer circuits was adjusted by the use of condensers and different coil windings. It should be possible, therefore, to create this differential impedance by the employment of the same winding in all cases and by varying the condenser in series with winding. The effective impedance is a resultant of inductance and capacity at the critical frequencies. In any case the ringer circuit must have sufficient high impedance to voice carrying currents to prevent noticable transmision loss.

QUESTIONS AND ANSWERS has not been able to consult any advertising material that is descriptive of this new Decimonic system of selective party line calling in which the frequencies of 20-30-40-50-60 cycles per second are used and in which all the ringers are wound to the same resistance, 4,000 ohms. The following comment, therefore, is not based on factual information but rather on a theoretical viewpoint based entirely on the data submitted in the inquiry.

There is very likely a distinct advantage, from the standpoint of the manufacturer, in winding all ringer spools to the same resistance, probably to the same number of turns of the same gauge of wire.

By this method the impedance offered to audio frequency and other voice carrying currents may be kept at a high value effectively reducing transmission losses due to the ringers that remain bridged across the telephone circuit during use. With this high impedance in the spool winding it is theoretically, at least, possible to adjust the effective total impedance to the optimum value for each of the ringing frequencies by using various capacity condensers. This is a very interesting inquiry and when the information becomes available it may be advisable to revise and amplify this theory. — ***Jay G. Mitchell.***

"Microwave At Work"

(Continued From Page 41)

receiver, with carrier facilities for 12 telephone channels have been installed. This equipment is wired for four-wire, two-way operation with only the transmit side being terminated to the radio receiver. *Figure* 3 shows the installation at the Sucat receiver station and *Figure* 4 the outside of the receiver site with the parabola antenna installed atop a 70-foot creosoted pole.

At the Manila terminal point three each transmitters and receivers and facilities for 12 channels of telephone carrier wired for four-wire termination were installed. The incoming voice channels are terminated to the receive side and the outgoing voice channels to the transmit side of the overseas radio telephone control terminals at Plaza Lawton.

A standby transmitter is provided for the Polo circuit and a standby receiver for the Sucat circuit, with automatic transfer equipment. *Figure* 5 shows the installation of carrier and microwave equipment at M. de Comillas (Manila terminal point).

One transmitter and one receiver on one antenna, and facilities for 12 channels of Type 33C1 equipment were installed at the Polo transmitter station. These were wired for four-wire operation with the receiver side terminated to the various HF radio transmitters used for the inter-island communications facilities. *Figure* 6 shows an interior view of the Polo transmitter station with the new equipment and *Figure* 7 an exterior view of the site.

Order wire facilities are provided

THIS *Nicopress* SLEEVE

plus

THIS *Nicopress* 17-2 TOOL

Make better pair splices faster than you've ever made them before!

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on the VF (voice frequency) channel which is part of the microwave system and is accessible at all three operating locations.

The radio and carrier equipment was recieved in Manila on April 15, 1955 and the equipment installed and placed in operation on May 31, 1955. Installation of the equipment, together with the mounting of the parabola antenna assemblies on existing antenna poles was undertaken by the company radio and plant personnel.

No difficulties or equipment faults were encountered despite the fact that the shipment had come half-way around the world. Operational tests and adjustments found in the manufacturer's plans and instruction manuals were followed in the service tests. Some of the original adjustments and optional wiring made at the factory were altered to adapt the operation of the control system to the existing equipment facilities of the telephone company.

Installation of the microwave system has resulted in a marked improvement in the quality of the control facilities and in an increase in commercial time available on the respective radio-telephone circuits. The 900 mcs operating frequency, being above the noise band generated by electrical devices and atmospheric noise due to static and other causes, has resulted in solving the problem of interference and noise on the control line facilities.

The installation has proved successful and is a forerunner of similar facilities at other operating points as required.—***H. E. Pratte.***

FIGURE SEVEN: — Polo transmitting station exterior.

Nationwide Toll Dialing

(Continued From Page 44)

the subscribers of the Independent companies as a matter of course, and must be arranged to maintain the economic welfare of the Independent companies.

In the light of these considerations it would appear that optional participation is both illusory and undesirable. If the Independent companies we are considering, who have so far been unable to justify the costs of participation, agree with these arguments and appreciate that ultimately they will have to provide the equipment and facilities necessary for nationwide toll dialing, they are now faced simply with the problem of recovering the costs.

In this respect an important consideration is that an Independent telephone company has only two sources of income, local service revenue and toll service revenue, and all costs have to be met from them. If the revenue from one of the services falls below the costs of providing the service, then the revenue from the other service must be increased if the company is to remain solvent. Thus, if participation in the nationwide toll dialing plan would cause the costs of providing toll service to be greater than the toll service revenues retained, local service rates would have to be increased to cover the deficiency. This would not only be unfair to the majority of the subscribers, but may also restrict the development of the company.

If the Independent companies are unwilling to subsidize toll service out of local rates then the only course of action left open to them is to negotiate for special toll settlement arrangements which will ensure that the costs of providing toll service will be fully reimbursed from toll revenues.

It is appreciated that much of the preceding discussion is controversial, and it should be emphasized that the views expressed therein are personal to the writer and are not necessarily concurred in by the companies with which the writer is, and has been associated, or by the Editor of this publication. If they have no value but to provide food for thought they will at least serve a useful purpose in stimulating consideration of a problem which is of vital importance to the Independent telephone industry.

The transition from manual and ringdown toll operation to nationwide operator and customer toll dialing will require an orderly progression over a number of years. The technical and financial pitfalls for the Independent companies will be many and deep. To avoid them, complete and close co-operation will be necessary between the Independent operating companies, the Independent manufacturers, their local and national associations, and the Bell System companies.

The purpose of these articles has been to interpret the requirements of the nationwide toll dialing plan for the small Independent companies, and they have been written with the circumstances of small end offices and small toll centers in mind. Those requiring further information will find most of their questions answered in the excellent "Notes on Nationwide Dialing," published by the Department of Operating and Engineering of the American Telephone and Telegraph Company, and in the report dated March 1955, of the U.S.I.T.A./ Bell Dial Interexchange Committee.

"Dial Comes To Town"

(Continued From Page 47)

dicates "vacant" or an unassigned number. For example: "5012" has been disconnected, "5014" changed to "7483."

"Partial" Intercept

IF PARTIAL intercept or no intercept equipment is provided, you should provide a record of "Working Lines and Stations." This should be maintained on a continuing basis to provide information to distant operators on incoming calls and as an adjunct to information service. You will receive requests for verification of the correctness of numbers from customers who have dialed without success. We use the same form for this record.

Perhaps the most frequent assistance request, which operators will receive will be for help in reaching a subscriber on their own party line. While such information is always included in the Customers Instructions pamphlet or in the directory, it is advisable to have the reverting call code posted at each position.

If in addition to local dial service, your office will have a new toll board, it is essential that you have an outline guide of the operating features of the new board for training purposes and equally essential that all members of the operating force be instructed in these features and have some time prior to cutover to become familiar with the physical layout of the equipment.

For the smaller operating company, whose staff does not include a Practices Supervisor to write such instructions, the following suggestions are offered for the use of the traffic instructor: Set up: —

(1) Description of Equipment —

(a) Keyshelf equipment: cords, supervisory signals, operation of talking and ringing keys. Add the operational feature of splitting and transfer keys, if provided. Dialing equipment and associated keys, peg count and automatic ring keys or push buttons should be covered.

(b) Miscellaneous equipment such as Supervisor's call signal, toll line signals and busy signals, ticket slots or spirals, calculagraphs, dial pilot lamp, out dial trunks, and other items.

(2) Method of Operation: —

Outline use of above equipment on Outward and Inward calls, explain the busy signal — flash at 60 pulses per minute accompanied by audible busy signal.

If a "no trunk" or "paths busy" is encountered in the equipment during dialing, a signal at 120 pulses per minute will be received. On delayed calls the customer will be reached over "Out Dial" trunks; explain holding and ringing of calling telephone.

Transfer of "TX" requests from customers and Incoming operators: If the new switchboard is a No. 3 type board there are important features different from other type boards:

(a) Only one cord circuit can be connected at a given time to the position circuit under control of the talk keys. If two talk keys are operated simultaneously, the lower-numbered will have preference.

(b) Dialing will be ineffective unless the talk key is operated.

(c) An overlapping feature is provided so that with the talk key operated on one connection and the monitor key operated on another, the operator may talk on the first connection and listen on the other simultaneously. She may however, split the connection, transfer or dial, only on the connection on which the talk key is operated.

(d) An operator may talk or monitor on one cord, and at the same time send ringing over the other cord of the pair.

(e) The dial is normally connected to the front cord, however, dialing can be done on the rear cord by operating the "Dial Rear" key.

If the Chief Operator's desk is provided with a turret at which information and intercept calls may be handled, you will want an instructional outline covering the operation of the keys. Many such turrets are provided with two-way lever locking keys, associated with the answering lamp which operate to "Talk" and "Hold" positions.

Other equipment such as Chief Operator trunks, repair service trunks, etc., may be installed. The method of answering and holding is generally the same as for information calls.

With your instructional outline prepared, you are ready for "D" day.

If your company is planning a cutover, which includes operator toll dialing on the nationwide network, and you are interested in a training outline for the operating force, we have such an instruction. If you are interested in having this instruction presented in article form, please write to TELEPHONE ENGINEER and express your wish for such material.—See you next month. ***Ruth E. Richards.***

"You and you're hollering from the back door to that friend down the street. The neighbors were beginning to send me threatening letters."

Guard your splices right with these

REG. U. S. PAT. OFF.

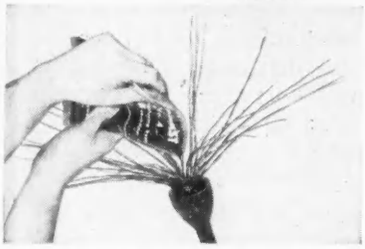
SCOTCH BRAND Electrical Products!

Approved for splicing plastic communications cable

"SCOTCH" Brand Plastic Tapes—the *original* plastic tapes. First developed and perfected in our own laboratories. Made to exacting quality standards. Tough, impervious vinyl plastic. Two thicknesses available: 7 mils (No. 33—the standard of all plastic tapes) and 10 mils (No. 22—for extra abrasion resistance).

"SCOTCH" Brand Aluminum Tape — has special adhesive to insure an effective moisture barrier. "SCOTCH" Electrical Tape No. 49 is available in 2 inch by 20 foot rolls.

"SCOTCHFIL" Electrical Insulating Putty —a putty in tape form. Application is clean, rapid, economical. Excellent as a fast build-up for cable splices. Long life, stays firm and flexible, doesn't dry out or become hard and brittle.



"SCOTCHCAST" in "Unipak" Container—casting resin and hardener in plastic double bag. Knead to break inner bag and mix hardener with plastic, then pour. Sets in a few minutes, provides a perfect moisture seal. Makes impervious moisture blocks in cable ends. Especially recommended for splicing lead sheathed cable to plastic sheathed cable.

Above products are approved for use in REA splicing procedures PC-2 and PC-3. Available at your wholesaler. Further information and copies of splicing procedures will be sent free on request. Write Dept. MI-36. Minnesota Mining and Manufacturing Co., St. Paul 6, Minn.

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3M COMPANY

Establishing New Rules & Regulations

By ERNEST W. FAIR

WHENEVER the time arrives to set up new rules and regulations for the telephone company or to make changes, then and there is the occasion which will determine how well those rules and regulations are followed and results attained later on.

Rules and regulations need care and planning just as any other phase of company operation. Setting the guides up carefully assures us that the purpose for which these rules are being established will be accomplished. Going about it without planning can mean trouble with employes, sloppy self-enforcement and where matters of policy may be concerned . . . interpretation of an erroneous nature by members of the staff.

Experience has developed several factors which must be carefully considered each time such a rule or regulation is drafted by the company executive if he wishes maximum results to be forthcoming therefrom. They form a basic skeleton around which to build every such rule or set of rules we may need to perfect the smooth running organization needed within our company.

(1)—*The statement of any policy* or rule should be definite, positive, clear, and understandable to every one on the staff.

This requires exact definition and positive statement. It calls for presenting the regulation in the simplest and most direct manner possible AND in the fewest number of words we can put together to do the job.

A long and involved statement leaves everyone groggy. The more we write on the point the more open to misunderstanding it becomes. Nor should there be any possibility for indecision on the part of anyone with regard to the subject matter presented.

The best rules and regulations are always those which are concise and to the point and which leave no doubt in anyone's mind about what to do under the circumstances covered.

(2)—*Where the rule or regulation* sets up a policy for the entire organization it should be of such a nature as to readily apply in practice, terms and peculiarities of each particular department of the company.

Each such regulation should be examined for its application in every individual department and not formulated, as is so often done, with just one section in mind. Following this procedure secures easy application in that particular department but makes compliance with the rules and regulations most difficult in other sections.

Where allowances are made for such varying conditions then the rule or regulation will not only be easier to apply but it will be drafted in such a form as to be understood readily by every one under the company banner.

(3)—*No rule or regulation* should ever be inflexible but they must possess a degree of understood permanency. The respect given such rules and regulations by everyone concerned will be in direct proportion to that individual's belief in the permanency of the rule.

"Shucks, they're going to change that next week — why pay any attention to it today," has been heard in many a company. If the desired ends are to be attained there can never be anything in a rule or regulation which will arouse such a feeling in the mind of any staff employes.

The wording or method of presentation should also remove any doubt in the minds of those affected as to the seriousness with which the rule or regulation will be administered. Often that frame of mind is established by how closely we ourselves follow such new rules and regulations.

(4)—*Stability is an absolute essential;* constant change of any rules or regulations make them valueless. Rules and regulations should never be established on the spur of the moment or without careful planning for such policies almost invariably require a number of changes. As each change is made total respect for the rules and regulations on the part of employes will vanish.

Any rule or regulation we set up must be thought out and discussed at length before being established to avoid this very factor. "Kinks" therein are much better worked out during this planning period than through actual practice which will require change after change and resultant lack of respect thereof.

(5)—*Keep the rules and regulations* as few in number as possible. There should be as many points as necessary to cover conditions that can be anticipated but not so many as to make the whole thing confusing or meaningless.

The best followed rules are always those presented in the fewest number of sentences. It is far better to present such a basic rule in this manner and supplement details verbally than to try to write everything into the code itself; doing so taxes the memory of any employe to handle the policy as a whole.

By nature we all hate rules and regulations anyway; we actually rebel against long, involved ones. Sometimes we are just too lazy to take the trouble to study out such intricate detail but we are seldom so mentally lazy that we cannot absorb one single sentence.

(6)—*No rule or regulation*

should ever be established on a basis of personal reflections or during an emotional period. Fact and sound judgment are the corner stones of every good rule and regulation.

None of us can trust even our own thinking processes under emotional strain. Any rules or regulations we devise during such periods are bound to reflect the emotions.

(7)—*Look at the "other side"* before every rule or regulation is established. We must remember that the other fellow is the one who will have to apply the rule or regulation we are devising. We have to be certain that he is capable of doing so . . . we must be sure it will not prove impossible of attainment by the mechanics of his jobs . . . we must be certain that it is not a direct imposition on any of his or her rights.

(8)—*Only in the very rarest of instances* should a rule or regulation set forth detailed procedure; this should be left to the individual's own thinking processes or to verbal presentation by supervisors who must administer the rules and regulations.

Where such minute detail is presented iron-bound procedure is established and conditions of variance which may arise will leave many people helpless and bewildered. The broad and basic policy should be established without doubt . . . then when the unusual occurs the individual can handle the situation under his own devices in accordance with this basic policy.

It is also to be noted that any such detailed spell out in a rule or regulation obviously makes it long and involved and therefore more difficult to understand, absorb and remember.

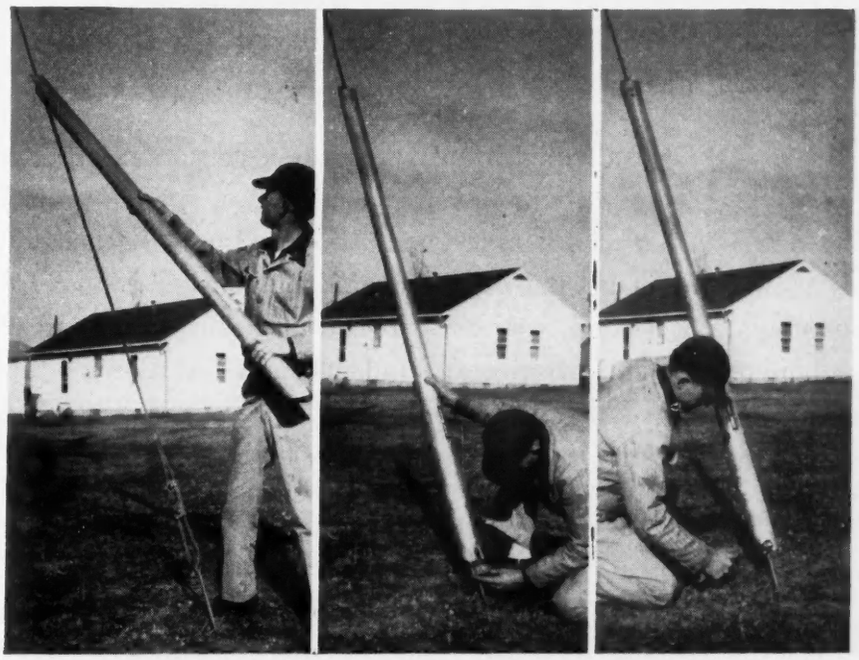
(9)—*Every rule and regulation* should be studied closely as to how it will affect previously established rules and regulations before it is posted. Attention should be called to any that supplants and revisions should be posted.

Making such a check-up beforehand will also eliminate the possibility of hurried changes later when such a conflict is discovered.

(10)—*Make sure every such rule and regulation* complies with existing laws of all kinds from city to federal level and with those affecting employes particularly. Reasons for this point are obvious.—***Ernest W. Fair.***

Tighten only 1 easy-to-reach bolt to install the CHANCE MONO-BOLT GUY GUARD

When a groundman installs a Chance Mono-Bolt Guy Guard, he has only three things to do:



1 Slip the flanged hook over the guy wire.

2 Place clamp on anchor rod and slide it into the slot at bottom of guard.

3 Tighten this one bolt at the lower end of the guy guard.

It's that easy—your men don't have to be extra tall—there's no stretching for high bolts to tighten . . . the Mono-Bolt clamp securely grips the anchor rod with a firm 3-point gripping action . . . only a single wrench is needed. Easy installation makes for proper installation.

Heavy gauge steel guard is hot galvanized for long life and high visibility.

Mono-Bolt Guy Guard comes in half or full round construction, in 7 and 8 foot lengths. Fits any size rod from ½" to 1¼".

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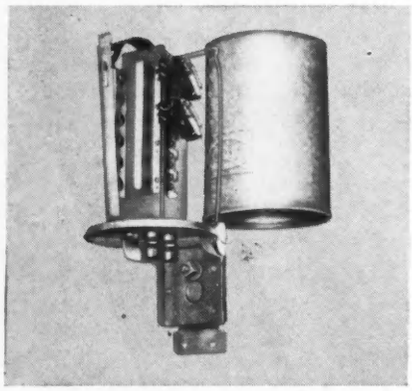
Published every month to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson Company

Two dividends are yours when you order supplies from Stromberg-Carlson. First, you get the protection of a double guarantee—ours and the maker's. This assures you of getting the finest products, backed by our 62-year reputation. Second, your support is used to further the art of telephony. We're knee-deep in this industry as a full-time job, not a side line, and your supply business plays a big part and helps us continue our research for new and better telephone equipment.

Versatile terminal for plastic cable installations

If you're installing plastic cable, you'll want the S-20V pole cable terminal, with its two cable entrances, each of which is arranged to accommodate compression couplings ranging from 6 pair to 51 pair in size.



Easy accessibility of this pole cable terminal interior makes it ideal for use with plastic cable.

When only one cable entrance is required, you close the dead entrance with a standard pipe plug. These features, combined with the flexibility of Cook Electric Company's H-20 protector units, make the S-20V protected pole cable terminal probably the most versatile pole cable terminal available.

Cane-seat chair keeps operators cool, comfortable

Making the operator as comfortable as possible may not strike you as a "maintenance" problem – yet your service is much smoother when the girls are cool and relaxed.

This operator's chair has a cane seat, which is much cooler, cleaner and more comfortable than other types. It retains all the posture advantages for which Sturgis is famed. It is called the Sturgis SC-240.

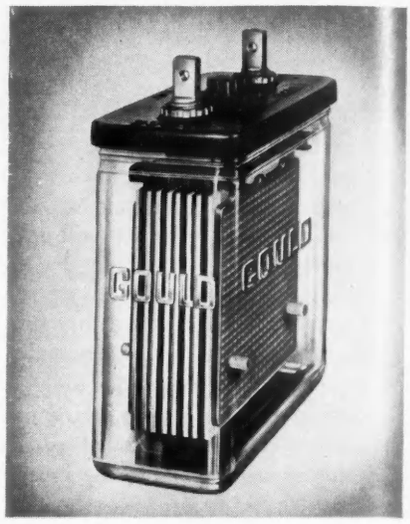
The posture-curved, well-cushioned backrest is covered in genuine leather.

The exclusive Sturgis "Follow-Flex" feature automatically adjusts to the operator's every movement, supports her restfully all the time, discourages fatigue, keeps her at top efficiency.

Other new and welcome features include a plastic-coated steel foot ring which retains its color, and a handy purse holder, available on request. Six seat heights, all adjustable.

Battery has lowest yearly cost

There's an easy way to save money on switchgear, signal and alarm systems or emergency light and power applications.



Gould Planté rolls up excellent service records—cuts maintenance to a minimum.

Amazing service records have proved that Gould Planté batteries have the lowest yearly cost of any battery you can use. Pure lead positive plates help make this possible.

For top operating economy, ask your Stromberg-Carlson representative for Gould Planté—the Aristocrat of Stationary Batteries.

Cable has polyethylene sheath for extra-long life

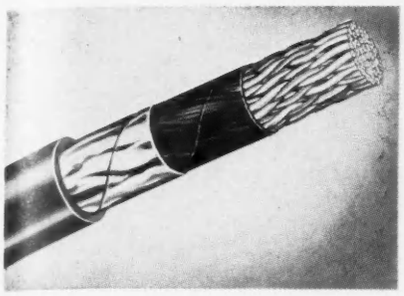
In outside cable installations, you can side-step the ravages of weather, sunlight and temperature, saving yourself many dollars and hours in maintenance.

To do this, use the protection of the polyethylene sheath on Telecable®. Telecable exchange area cable for aerial and duct use has polyethylene insulation **and** polyethylene sheath. No other thermoplastic material has given as good assurance of aerial cable sheath life expectancy as has polyethylene.

Specially treated to resist sunlight, the Telecable sheath has maximum chemical resistance, is not subject to environmental cracking.

Extremely light in weight, tough, yet flexible, it resists the stresses encountered during installation.

You can expect top performance of Telecable for upwards of 20 or 25 years.



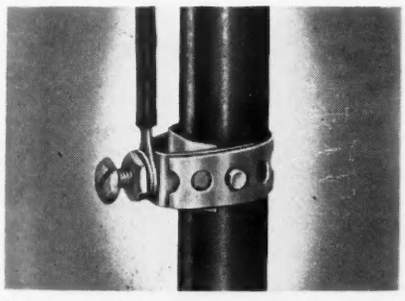
Telecable exchange area cable has outstanding weather resistance and transmission qualities.

Available in No. 24, No. 22 and No. 19 A.W.G. in sizes up to and including 202 pairs. For further information, consult your Stromberg-Carlson representative.

Want a good station ground for ⅜" to 1¼" pipe?

For all telephone, radio and signal circuit station grounds, here is a clamp with a tighter grip than a blonde clinging to a sailor's arm.

It's made by Reliable Electric Company, and has design principles which have been proven in the field to maintain high-pressure contact and maximum conductivity to the joint. This vise-like grip gives you the dependable grounding you need.



Station ground clamp is adjustable for grounding to water pipe, gives maximum conductivity to joint plus high-pressure contact.

The Reliable station ground clamp is for ⅜" to 1¼" pipe, easily adjusting for any size in that range. It is made of tinned copper strip. The screws and nuts have close-fitting threads.

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STROMBERG-CARLSON

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Modern Cable Construction

(Continued From Page 51)

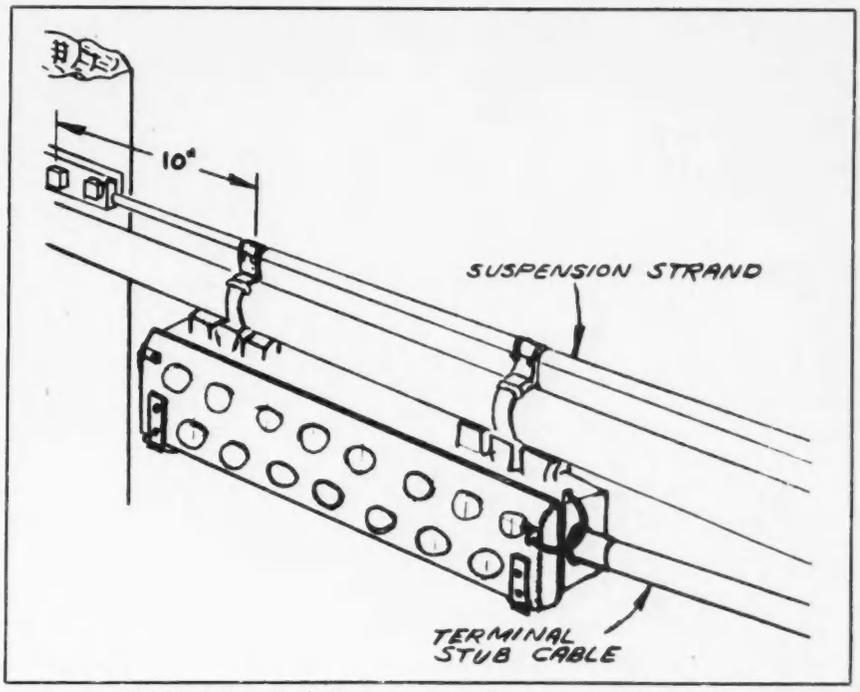


FIGURE 145: — Cook Stranterm mounted on ring-supported cable.

The stub is spliced to the main cable to obtain the correct polarity of the binding posts and the proper order of the pair count from left to right, regardless of whether the stub is brought out of the right or left end of the terminal. The stub cable from the terminal is secured to the main cable by means of ½ to ¾ inch spacers installed in the usual manner with the first spacer being located 10 inches from the center of the terminal clamp.—*(To Be Continued.)*

Williams Appointed Director, BDSA Communications Div.

THE APPOINTMENT of Robert E. Williams, an executive of the Automatic Electric Co., Chicago, Ill., as Director of the Communications Division, Business and Defense Services Administration, U. S. Department of Commerce was announced last month by BDSA Administrator Charles F. Honeywell.

In accepting this appointment, Mr. Williams brings to the agency current expert knowledge of the communications industry, with which he has been associated for approximately 30 years. After serving with BDSA for some six months, he will continue to be available thereafter as a trained reservist in event of any future emergency.

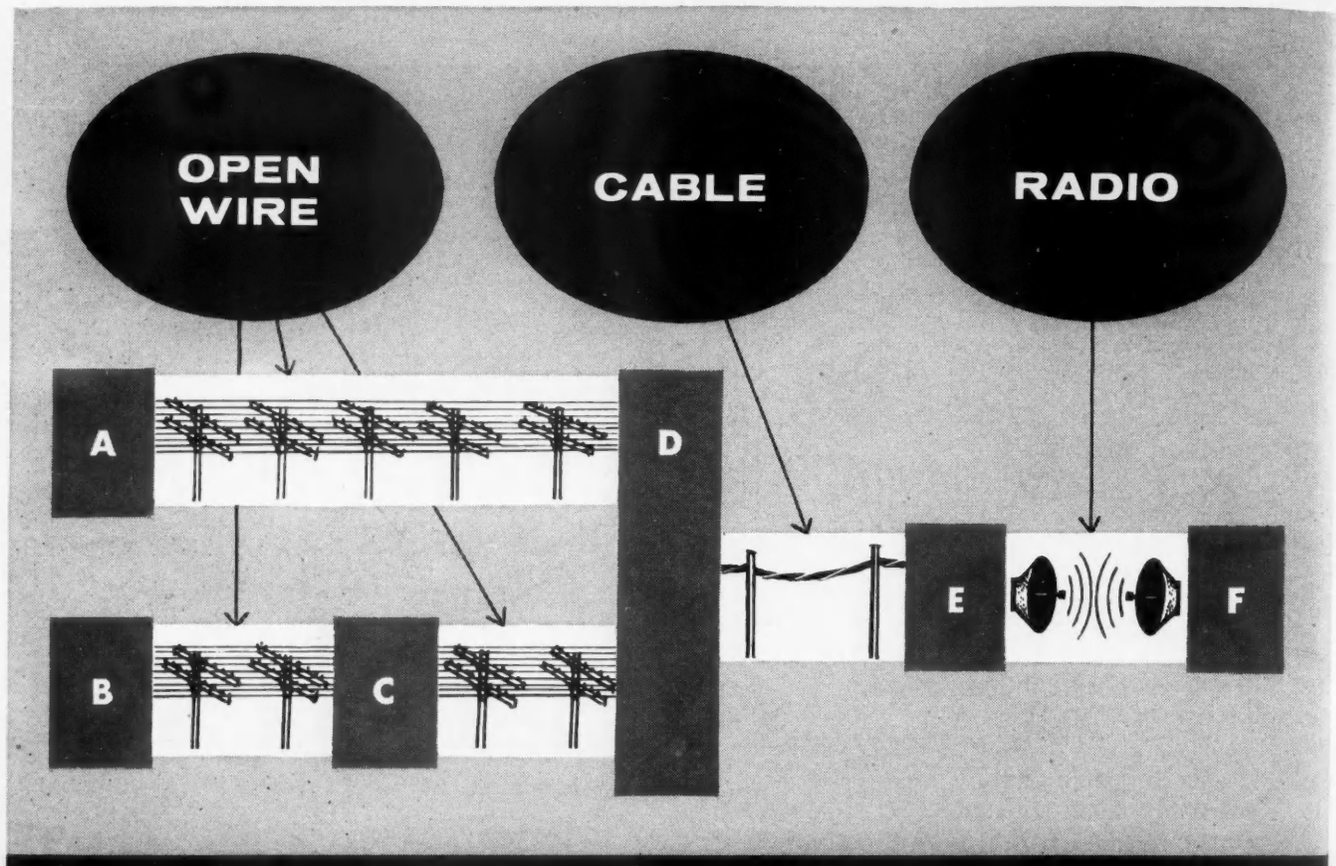
During the war in Korea, when industry was called upon to provide experienced personnel for Government service, Mr. Williams served without compensation as Director of the Communications Equipment Division of the National Production Authority from September, 1951 to March, 1952.

Mr. Williams entered the communications field in 1927, at Kansas City, Mo., joining the Theodore Gary & Co. group of communication companies as assistant secretary of the Telephone Bond & Share Co. From then until 1939 he held various positions in the principal investment companies of the Gary group, including the Associated Telephone & Telegraph Co., the parent firm.

In 1945 Mr. Williams went to Chicago, and two years later he became chief executive of the Telephone Operating Division of The Gary Co. In that post he supervised the domestic and foreign operating companies.

Mr. Williams is on leave from the Automatic Electric Company, which is the principal manufacturing unit of the General Telephone Corp.

Mr. Williams is a native of DeSoto, Mo., where he was born in 1901. He was educated at Drury College and the University of Missouri.



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Type 45CB base group terminal
Type 45A terminal
1 pre-group connector

LOCATION D
2 Type 45A base group terminals
Type 45BN base group terminal
2 base group connectors

LOCATION E
Type 45BN base group terminal
Type 45BX terminal
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LOCATION F
Type 45BX terminal
Radio terminal

Direct interconnection is the basis of Lenkurt's famous 45 "universal" class of carrier systems. Each of these carrier systems —open-wire, cable and radio—is designed to connect directly with the others *at carrier frequencies.* Thus, your entire carrier network can be completely coordinated. Think of the savings and improved performance this means to you! Expensive back-to-back equipment arrangements to convert carrier to voice frequencies, and then back to carrier, are no longer needed. Maintenance is simpler. Distortion is reduced. Here is a new approach to planning and engineering your toll routes.

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Offices in principal cities.

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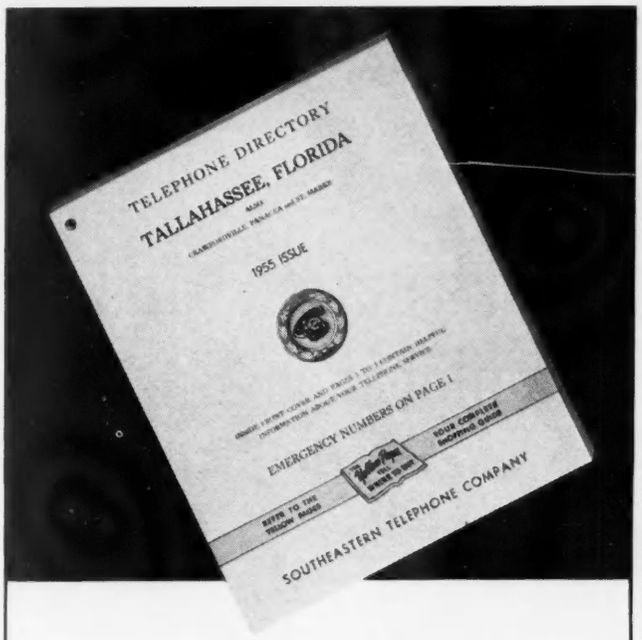

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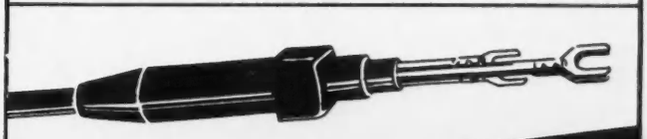

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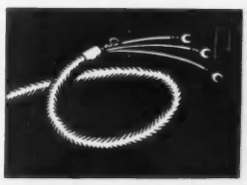

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April 15, 1956

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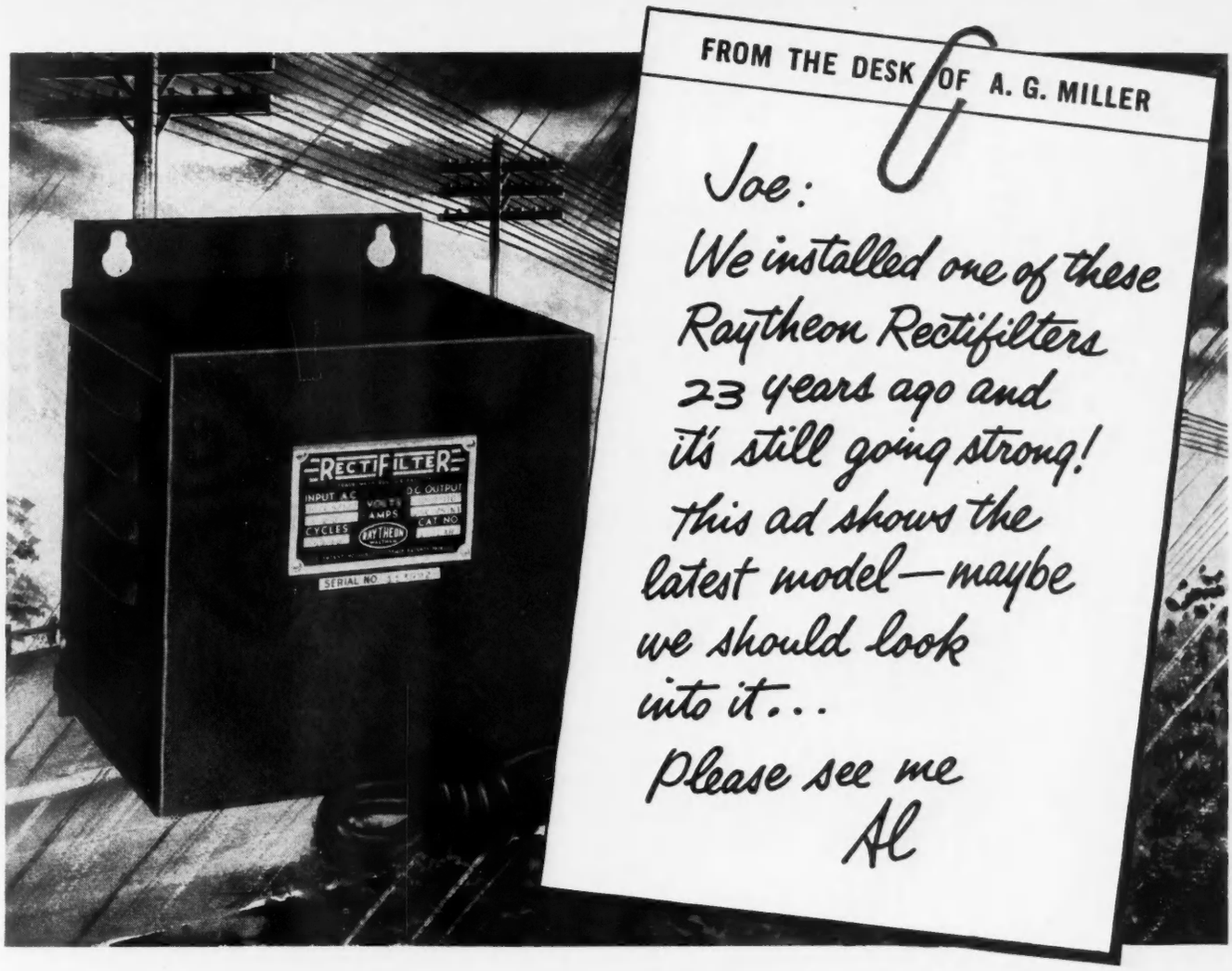

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Raytheon products for the telephone industry include Rectifilter battery eliminators, Recticharger® battery chargers and Rectiringer® eliminators with 20 cycle ringer—all available from your telephone supply house and Raytheon District Offices. Service and parts are supplied from ten locations throughout the USA. For full details, please write for Bulletin 4-335.

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- √ Minimum service—plug it in, close the door and forget it
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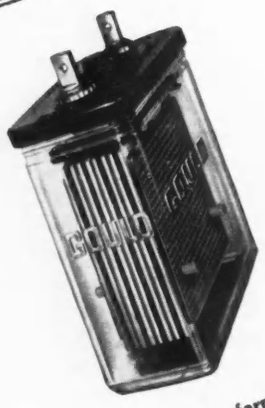
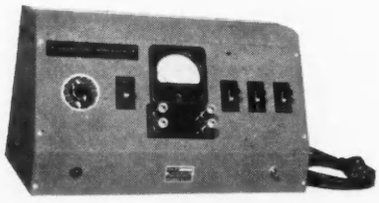
Improve Service, Reduce Costs and Eliminate Power Supply Problems with RECTIFILTER. Eliminates installation of storage batteries . . . operates one or more P.B.X.'s, or one or more Key equipments from an AC source. RAYTHEON MFG. CO.

World Standard for Quality since 1870—Hemingray Insulators—a product of OWENS-ILLINOIS, are available in a variety of styles and sizes for immediate delivery. No. 45 - shown - employed for all toll and trunk circuits exceeding ten miles in length.



Outstanding Battery Performance is yours when you choose Gould Plante Batteries. Thick, grooved, pure lead positive plates give many years of trouble-free service! Made by GOULD-NATIONAL BATTERIES, INC., the finest money can buy.



Shallcross # 392-A Transmission Test Set Provides a convenient and an inexpensive means of measuring transmission line losses in 600 ohm lines; switchboard circuits and other equipment. Measures comparative capacitance of condensers and tests the balance of repeating coils and relays. SHALLCROSS MFG. CO.

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- Quick delivery
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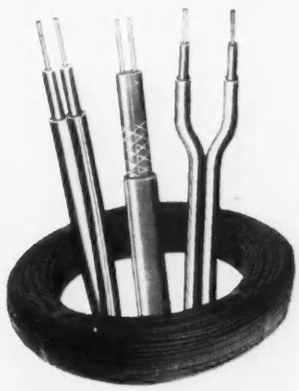
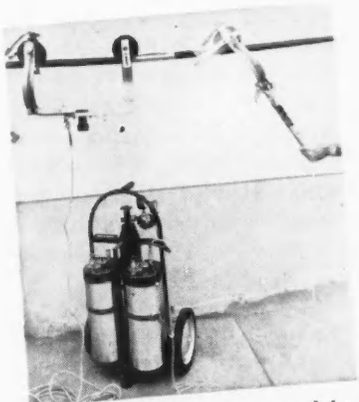


Long Service Life and Low Plant Costs go hand in hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in Copperweld and Bronze. This flexible and easy-to-handle wire is made by GENERAL INSULATED WIRE WORKS, INC.



Cable Leak Detector —Two models are illustrated. Model at left is for high cables. Nozzles spray cable, air pressure from tanks cause air bubbles clearly seen from ground. S & G MFG. CORP.

3 Useful Tapes: — Bishop Vinyl Electrical Tape . . . Bishop No. 125 Electrical Filler Tape . . . Bi-Seal Self-bonding (polyethylene based)) Electrical Tape. BISHOP MFG. CORP.

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Bell System Earnings Hit New High in '55 $1.6 Billion Spent on New Construction

BELL SYSTEM earnings on American Telephone & Telegraph Co. stock were $13.10 a share on the average number of shares in 1955, President Cleo F. Craig said in the company's annual report, mailed to 1,409,000 share owners last month.

Return on invested capital was 6.8 per cent, compared with 6.2 per cent in 1954, when earnings were $11.92.

Nearly 6 million more shares were issued during the year — mainly from conversions of debentures — and the number of share owners increased by 102,000, the largest increase of any company during 1955.

More than 85 per cent of the year's earnings were needed to pay dividends and maintain the retained earnings protecting each share, leaving less than 15 per cent available to increase retained earnings per share, Mr. Craig said.

"These are still quite low and needed strengthening in a good year like 1955 if we are to make prudent provision for future years when business conditions may be less favorable," he said.

The higher earnings were mainly the result of the rapidly expanding economy, the unprecedented prosperity generally, and "vigorous promotion of telephone services."

Most AT&T postwar financing has been through convertible debentures. An issue of $637 million of 3-7/8 per cent convertible debentures became convertible into stock on December 13. At the end of the year, almost half the issue had been converted.

Early last month AT&T called for redemption on May 1 all the then outstanding 3-3/4 per cent convertibles of 1965. The redemption price is $106 for each $100 of debentures. However, until May 1 these debentures may be converted into stock on payment of $36 in cash with each $100 of debentures turned in. The conversion privilege expires at the close of business May 1.

More telephone users were able to dial their own calls to nearby points outside their local service area in 1955.

About 500,000 telephone users in 65 exchanges could dial directly to some 16 million telephones in 17 metropolitan centers around the country. This service is being extended steadily, said Mr. Craig. By the end of this year, people in 250 exchanges will be dialing nationwide.

"Within a few years, most telephone users will be able to call across the country as quickly and as easily as they now dial neighbors across the street," he declared.

More conversations crossed oceans in 1955 than ever before — 1,200,000 between the U.S. and 108 other countries or territories. This was four times as many as 10 years ago and 25 times that of 15 years ago.

Service on new undersea telephone cables to Great Britain and Alaska will begin late this year. Work is under way on a cable to Hawaii. It is expected to be in service in 1958.

Bell System companies spent a record $1.6 billion on new construction in 1955. They added 2,880,000 telephones — almost half again as many as in the previous year. Nearly a million colored telephones were installed.

Western Electric — the manu- and supply unit of the Bell System —delivered about 30 per cent more telephone cable, 52 per cent more dial central office equipment, and 48 per cent more telephones than in 1954.

Two-thirds of all equipment produced by Western is of types developed within the past 10 years.

"This is the practical, concrete translation of scientific discovery into better and more valuable telephone service," Mr. Craig said. "This process of transforming our physical plant is never ending, and it will be even greater in the next 20 years than in the last."

Closing the report's service summary, Mr. Craig paid tribute to the 745,000 men and women who work for Bell System Companies:

"Again in flood, hurricane and other emergencies, Bell System men and women did a splendid job. And in every day's work, it is always the skill and spirit of telephone people that make good service. Both will count in the even larger undertakings we see ahead in 1956."

General of N. W. Names Walter, Plant Instructor

ORIN C. WALTER has been named to the position of plant instructor with General Telephone Co. of the Northwest. The newly-created position is a promotion for Walter, who for the

past eight years has been wire chief at the Wallace, Ida. exchange. He will operate out of the company's eastern division offices at Coeur d'Alene.

A native of Montana, Walter started with General as a groundman in 1936 after graduating from Bonners Ferry, Ida. high school, Cooke School of Electricity at Chicago and attending Kinman Business University in Spokane.

He was made an apprentice combinationman at Wallace in 1939 and transferred to Moscow as a switchboardman the following year. After serving for six years in this capacity both at Moscow and Farragut, Ida., he was transferred to Coeur d'Alene as an automatic switchboardman. In January of 1948 he was promoted to wire chief at Wallace, his position until now.

Ill. Bell Announces Plans For New Radio Relay System

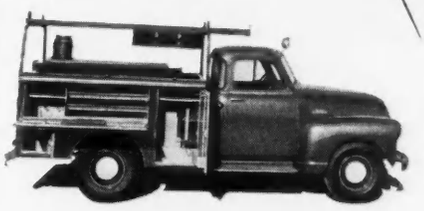
PLANS FOR THE construction of a new radio relay system in the Chicago area have been announced jointly by Illinois Bell Telephone Co. and the Long Lines Department of the American Telephone & Telegraph Co. The $4,500,000 section is part of an over-all route which, when completed, will extend from the east coast to the west coast .

The route, another backbone "voice highway" in the nation's communications network, will begin at La Porte, Ind., and circle southward around Chicago to Palmyra, Wis. It will pass through Kouts, Ind., Momence, Bonfield, Norway, Lee and Winnebago in Illinois; and Sharon, Wisc.

The system is for transmission of long-distance calls, and will not be used for network television. Long Lines is building the network.

Plans call for the building construction to be completed by early summer. The Western Electric Co. will begin equipment installation at that time. The new section is scheduled to be placed in service late this fall.

Five new buildings, ranging from 22x36 feet at Bonfield to 80x130 feet at Momence, and additions to three existing buildings will be constructed. Six new towers will be built, the smallest 187 feet at Winnebago and the tallest, 325 feet at



Here's a cable splicers' body that's always ready for work—routine or emergency. It's the compact Series 44-CS-90 Body . . . designed for action . . . equipped to carry everything needed on any job. Here's a 90" workshop that's a cable splicer's dream come true. Why not put it to work in your operation?

Here's what it's designed to carry:

Gas cylinders • climbing equipment • ropes • solder pot and stand • Wheatstone bridge • amplifier • pressure test set • test light • manhole light • axe • hand saws • flash lamp • cotton sleeving • tape insulation • cable splicer's platform • test set • soap solution • kerosene • "men working" signs • ladders • tent • sleeves • tree trimming tools • drinking water • pipe • wire reels • and all tools, parts, and supplies needed for any job.

Want More Details?
A copy of information-packed Bulletin No. 120, complete with prices, will be sent on request—without obligation.

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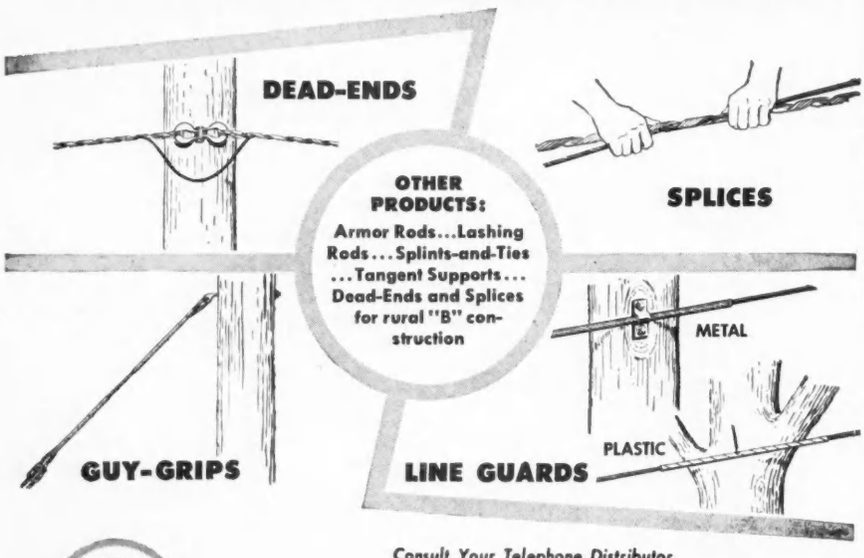
The Preformed method of producing line accessories is an exclusive new development for the telephone industry. It incorporates the use of Preformed Rods—helically formed within exacting tolerances—to serve varied "fitting" functions all along the line. No more bolts—no compression tools—simplified construction. More than just something new, Preformed Products represent a better, faster and more economical way to *dead-end, splice, support,* or *protect* conductors and strands.

For more information on their exclusive advantages, consult your telephone distributor.

A COMPLETE LINE FOR THE TELEPHONE INDUSTRY...



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PREFORMED LINE PRODUCTS COMPANY

5349 St. Clair Avenue • Cleveland 3, Ohio

Kouts. Each tower will support four or more antennas of the latest design call horn reflector antennas.

The Bell System recently perfected this new antenna which resembles a giant cornucopia, or "horn of plenty." It has the greatest capacity of any Bell System antenna in use. The new antenna can handle several groups of wave lengths in comparison with the ones in general use that transmit or receive only in one band of frequencies without interference.

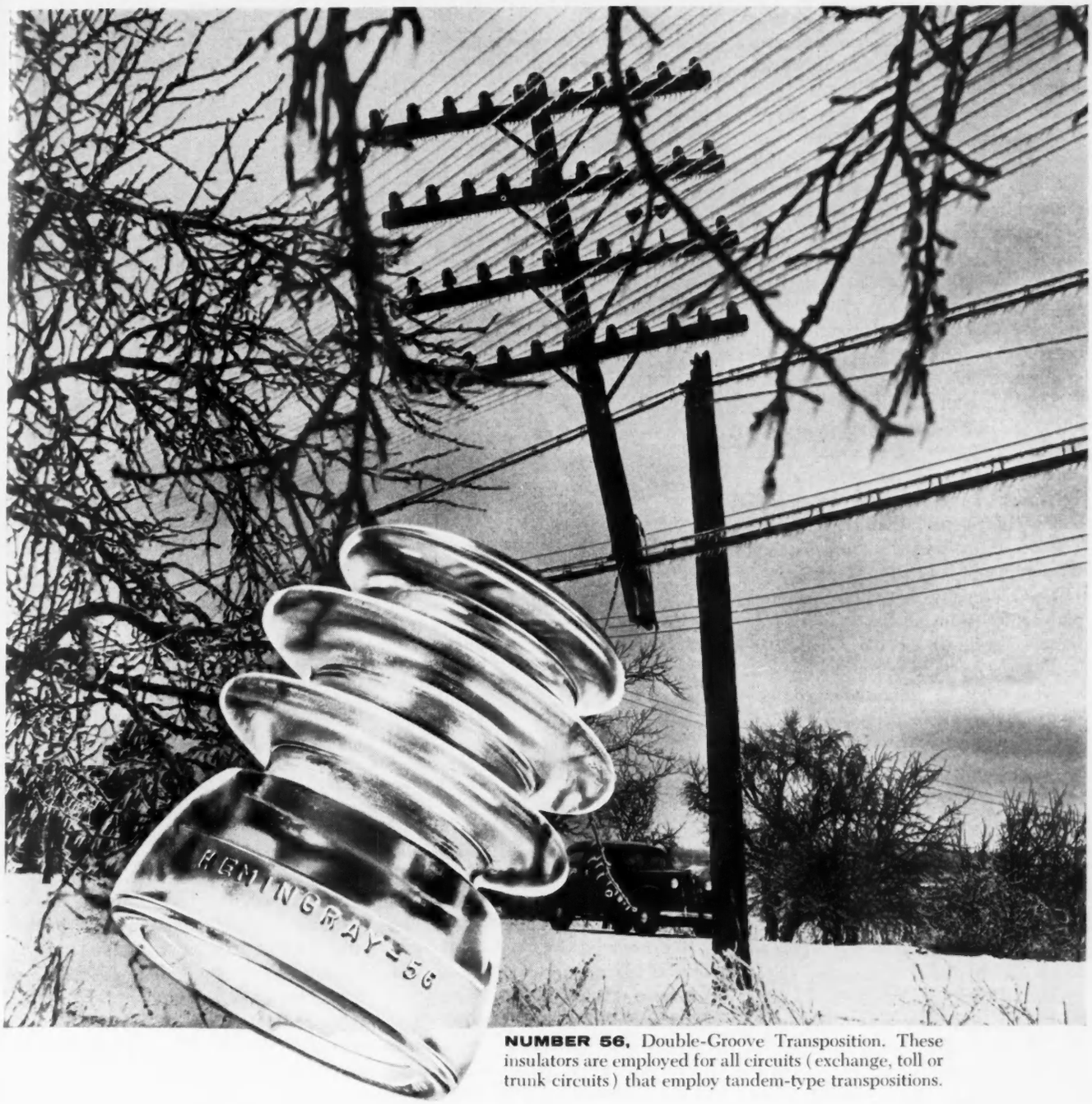
The "horn-of-plenty," each 20 feet in length and extending from a base some three inches wide to a width of 10 feet at the top, can handle 20,000 telephone conversations or 30 television programs simultaneously, when coupled to the proper terminal equipment. Its transmitting or receiving mouth covers 65 square feet and has a plastic cover for weather protection. One antenna is required for transmitting and another for receiving in each direction. Consequently, each tower has four antennas mounted on it. The new antenna can be used simultaneously in the 4,000, 6,000 and 11,000 megacycle bands. Previous antennas could only operate in the 4,000 megacycle band. The antenna weighs approximately 1,500 pounds.

A new type wave guide to carry the signal between ground level and tower top was designed for use with the cornucopia antenna. The new wave guide is round and is more than twice the size of the one used with the old type antenna. The new wave guide, like the old, is made of copper. In the radio relay method of transmission super high frequency radio waves called "microwaves" are sent from point to point. Like light beams, microwaves travel in a straight line and are focussed like a spotlight from one antenna to the next. This limits the distance between towers to approximately 30 miles. The tower heights along this route vary from 187 to 325 feet.

Rate Boosts Granted Lima, Peru Company

An Increase in telephone rates for greater Lima, Peru, has been approved by the Peruvian Government as part of an expansion plan presented by the Compania Peruana de Telefonos, Ltd., an IT&T subsidiary.

The company, which operates the system for Lima and its suburbs



NUMBER 56, Double-Groove Transposition. These insulators are employed for all circuits (exchange, toll or trunk circuits) that employ tandem-type transpositions.

Dependable ...in emergencies

When they're on the line, you can *depend* on their strength and uniform high quality.

When you order you can *depend* on prompt deliveries of what you need . . . when you need it.

Since 1870, when Robert Hemingray began mass production of screw-thread insulators, Hemingray has pioneered most of the insulator developments to keep pace with the requirements of the communication systems of the world.

Today, as always, Hemingrays are world standard for quality, and most of the overhead telegraph and telephone lines of the world are carried on *dependable* Hemingray Glass insulators. They are a product of Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.

HEMINGRAY INSULATORS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

and the port city of Callao, had long petitioned for an increase as rates were among the lowest in the world. The increase is now in effect.

The expansion plan includes the installation of 38,200 telephones during the next seven years. Of this number, 6,800 will be placed in service within the next three years.

Monthly rates on commercial telephones (first grade) rose from S/.100 to S/.220 (about $11) and on home telephones from S/.30 to S/.50 (about $2.50). Corresponding increases went into effect on other types of installations.

Shortly after authorizing installation of 38,200 telephones in greater Lima, the government granted another company (Cia. Nacional de Telefonos) authorization to install 30,000 telephones. Cia. Nacional de Telefonos, operates the long distance service throughout Peru.

This company has been granted permission to install the 30,000 additional telephones in the Lima area within a 2½-year period. The two services may be interconnected and eventually result in a total of 68,200 new telephones in Lima.

You'd think the man in charge of communications for the Pacific Gas & Electric Co., North Bay California Division, would have to be a big talker. Well, Eugene B. Woods *is*, even though he had his larynx removed because of cancer back in 1941. Mr. Woods had seen his boss die of cancer of the larynx because the man had neglected to have it treated in time. So when Woods needed surgery, it took place almost at once. Today he's cured, and he's one of the *American Cancer Society's* most vocal spokesman. His job calls for a lot of talking but Eugene Woods goes further — he addresses civic groups and service clubs stresses the *American Cancer Society* message that early detection of cancer and prompt treatment can help save lives.

Are *you* doing what *you* can to guard against cancer? Make it a habit to have a medical checkup at least once a year. And you can fight cancer, too, by giving generously to the 1956 *Cancer Crusade of the American Cancer Society*.

R. H. Rawlings Elected Vice Pres. of Ohio General

RICHARD H. RAWLINGS has been elected vice president of the General Telephone Co. of Ohio. He has had a distinguished career in the telephone industry starting with the International Telephone & Telegraph Corp. in 1927. After serving one year with that corporation, he was assigned to Uruguay, Argentina, and Chile, where his work involved toll transmission and installation of the first South American transcontinental telephone line.

From 1932 to 1935, he was engaged in engineering for Buenos Aires regional organization responsible for International Telephone & Telegraph properties in Argentina, Chile, Peru, Uruguay, and Southern Brazil. In 1935, the corporation appointed him operating superintendent of Chile Telephone Co. In 1938, he became managing director of the Rio Grandese Telephone Co. in Southern Brazil. In 1942, he became a director, in Rio de Janeiro, Brazil, of four International Telephone & Telegraph Brazilian subsidiaries.

Mr. Rawlings then became operations vice president of the Porto Rico Telephone Co., and in 1946, he was appointed operations vice president of the Cuban Telephone Co., and of the Radio Corp. of Cuba, subsidiaries of International Tel. & Tel.

In 1948, he accepted an assignment to Spain, where he was technical advisor to the Spanish National Telephone Co. He was also appointed a director of the Spanish Telephone Co. and of three I. T. & T. Spanish subsidiaries.

General of Ohio Reports Record Expansion In 1955

GENERAL TELEPHONE CO. of Ohio provided greater service for more subscribers in 1955 than in any year of its history, Clare E. Williams, president of the company, announced recently.

During the year a record total of 136,139,000 local calls were completed through the company's 135 exchanges, an increase of more than 9,347,000 calls over 1954. General subscribers originated and received more than 15,500,000 long distance calls during the year, about 1,400,000 over any previous year.

In March, 1955 the company installed its 100,000th telephone in Madison County, becoming the 14th Independent telephone company in the United States to attain that number. On December 31, 1955, total telephones in service were 105,156, a net increase of 6,190 for the year.

For expansion and improvement of service, gross expenditures of $4,488,000 were made by the company in 1955. The construction program comprised 259 major projects, including the placing in service of eleven complete new dial central offices. Nine new central office buildings were constructed to house new dial installations. The program also involved the placing of thousands of new telephones, new poles, and many millions of feet of cable and open wire, together with other facilities.

One outstanding project completed in 1955 was Ohio's first multichannel microwave system for general long distance telephone communication. This system enables simultaneous transmission of many long distance messages over a direct-

TELEPHONE ODDITIES by HIGGINS
THE FOLLOWING FAMILY NAMES ARE FROM THE LOCAL DIRECTORIES IN HAWAII:
AI, SU, BO, DO, EA, HA, HO, HI, I, JA, KU, LA, LI, LU, MA, NG, OI, PA, SA, SO, TI, UA, WO, WU, YI, AND YU
A MAN IN MUSKEGON, MICH., LOCKS HIS HOME PHONE IN A BOX EVERY MORNING BEFORE HE GOES TO WORK, TO MAKE SURE HIS WIFE GETS ALL THE HOUSEWORK DONE
IN OKLAHOMA CITY, POLICEMEN BEGAN DICTATING THEIR CRIME REPORTS INTO TELEPHONES FOR TRANSCRIPTION INSTEAD OF DIRECT TO PRETTY STENOGRAPHERS— THE NEW SYSTEM RETURNS OFFICERS TO THEIR DISTRICTS MORE QUICKLY
GO INTO THE NEXT ROOM AND I'LL REPORT TO YOU ON THE PHONE—HONEY
LONG DISTANCE OPERATOR
THE LONGEST TELEPHONE LINE IN AFRICA WAS OPENED RECENTLY—IT RUNS 1,750 MILES ALONG THE NILE AND LINKS CAIRO AND KHARTUM WITH JURA A SOUTH-WESTERN SUDANESE TOWN OF 8,500
TOM HIGGINS JR.

ional radio beam at ultra-high frequency without interference or disturbance from the elements. Steel towers ranging between 150 and 170 feet and bearing huge parabolic reflectors mark the terminals at Bryan in Williams County, Antwerp in Paulding County and Fort Wayne, Indiana. Over radio beams between these towers long distance messages are routed between 100 communities. This complex electronic installation was placed in service December 18.

The expansion and improvement of plant which characterized the year 1955 were a continuation of consistent high-level construction activity by General Telephone Company of Ohio, said Mr. Williams, pointing out that since 1946 the company had made gross expenditures for plant in excess of $30,000,000.

He cited as some of the results of this construction the addition of more than 46,000 telephones through installations, the placing in service of 63 new dial central offices, and the construction of 52 new buildings. Over this period the company placed about 136,000 new poles and installed sufficient wire to encircle the earth approximately six and one-half times. More than 1,100 additional long distance and interexchange circuits were provided. The increased facilities have enabled completion of 52,000,000 additional local calls and 6,000,000 additional long distance messages each year.

Carolina T. & T. Announces $1,300,00 Due Project

A $1,300,000 Expansion program in its Washington (N.C.) exchange, involving construction of a new building, a dial conversion and substantial additions to outside plant facilities, was disclosed last month by L. W. Hill, president of Carolina Telephone & Telegraph Co. Conversion of this exchange to dial will leave only two of the company's 110 exchanges in manual operation.

Scheduled to be completed during

clear lines fast with...

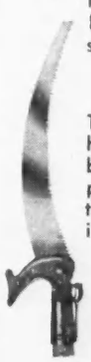
SEYMOUR SMITH
"Telephone" Tree Pruner

Here's the standard, the choice of the utility industry for years. Powerful action to cut cleanly—tough and almost unbreakable—easy to handle. No. 12 Pruner Head has 1½" cutting capacity. The lighter, No. 11, handles up to 1" branches. Both are malleable iron castings with tempered steel cutting blade.

Poles (18 ft. 3 sections) are of selected spruce with positive locking, seamless aluminum, telescoping ferrule joints.

FAST CUTTING PRUNING SAWS

Designed for fast, easy cutting—large, deep teeth, finest Swedish charcoal steel, streamlined, laminated hardwood handles. Every model you need up to chain saw work.



No. 20 POLE SAW HEAD

Tough aluminum head with large hook and outside horn for pushing branches, raising wires, etc. Also paint brush holder with wire clamp that holds brush securely. Fast-cutting 16" blade. Poles available.

FREE: Send for Seymour Smith catalog pages on tools for utilities. Keep them on file for easy reference.

Quality Tools
SEYMOUR SMITH
Since 1850

SEYMOUR SMITH & SON, Inc.
4403 Main St., Oakville, Conn.

construction and maintenance DIGEST

- 25-year battery
- In the (sq.) groove
- Splice in a trice
- "Freeze" frequencies
- These two

Published every month to help you get the most out of your materials and supplies dollar

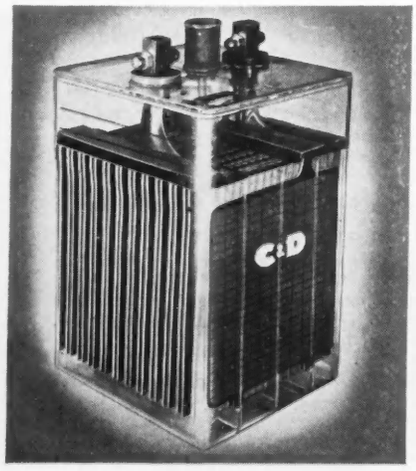
by C. J. Reynolds, Stromberg-Carlson Company

Two dividends are yours when you order supplies from Stromberg-Carlson. First, you get the protection of a double guarantee—ours and the maker's. This assures you of getting the finest products, backed by our 62-year reputation. Second, your support is used to further the art of telephony. We're knee-deep in this industry as a full-time job, not a side line, and your supply business plays a big part and helps us continue our research for new and better telephone equipment.

Battery will still have its pep when 1980 rolls around

It will last 25 years—in full float service! That's the life expectancy of C & D's PlastiCal (lead-calcium grids) telephone battery.

You get this extra-long, trouble-free operation because C & D Batteries, Inc. use an exclusive suspended and supported plate construction.



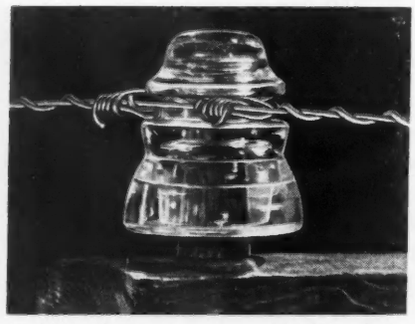
In full float service, this telephone battery stays on the job a quarter of a century.

Illustrated here is a typical C & D telephone battery with a 660 A.H. capacity. When ordering this 25-year battery, specify PCE-660.

When you find that a 14-year expectancy meets your needs, you can get dependable operation from a C & D PlastiCell (high-tensile lead alloy grids) battery. For a PlastiCell with capacity of 660 A.H., specify CE-23.

Use this insulator for rugged line construction

Hemingray Number 45 insulators with their square groove provide the ideal slot for your wire. Their reinforced construction under the groove reduces the possibility of breakage of the flange under the most severe ice loading conditions.



Double petticoat, square groove No. 45 insulator.

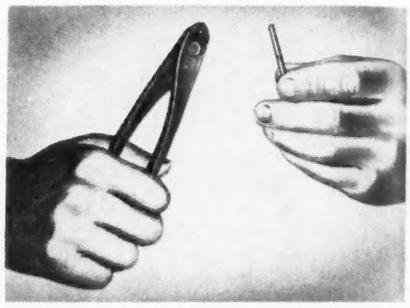
The extra long leakage path and double petticoat will reduce line losses and insure the strongest signal possible. These insulators are highly recommended for use on dial circuits where the strongest possible signal is necessary.

Hemingray insulators, the "World standard since 1870," are made by Kimble Glass Company, subsidiary of Owens-Illinois.

Splice it fast . . . and it stays fast

Here's how to make a quick splice that holds fast, even under the most intense vibration. In fact, your splice will outlast the conductor!

You need two items; a Nicopress sleeve, and the Nicopress tool that is designed especially for use with these sleeves. You simply butt the bared wire ends together inside the sleeve, and you've got a joint that won't ever pull out! Quick and easy.



This Nicopress 17-2 tool plus this Nicopress sleeve make better pair splices, faster.

The alloy lining inside the sleeve is harder than either the conductor or the sleeve, and forms a joint that is stronger than the rated breaking strength of the wire itself. **And** it has a high, lasting conductivity.

Also—joints made with Nicopress sleeves are small and neat, so they may be applied on inside wires as well as outdoor lines.

Converter for harmonic ringing stops frequencies from creeping

Cross-ring in a harmonic ringing system can only be prevented when you find some way to nail down each of the five frequencies—16-2/3, 25, 33-1/3, 50 and 66-2/3 cycles.

If you have looked into this problem, you'll be pleased to know that there is a machine that actually does just that – pins down each frequency and **locks** it by a definite ratio to the 60-cycle input frequency.

This machine is the Lorain H-5 Sub-Cycle. It uses a special principle of operation, making it **impossible** for your ringing frequencies to creep out of line.

Add to this the fact that the H-5 Sub-Cycle provides exceptional voltage regulation—preventing ringing troubles—and you have a very useful machine indeed.

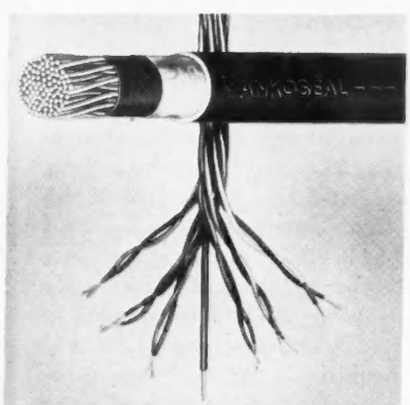
Lorain H-5 Sub-Cycle.

It's economical to operate, too—the H-5 Sub-Cycle has no moving parts, no expendable components. You just install it and forget it. And it requires only 1400 watts power at full load—slightly more than the full load requirement of a 1 H.P. induction motor.

Choose from these 2 self-supporting cables

Yes, you **do** have a choice in self-supporting cables!

For standard exchange uses, you can get lots of service with the impervious, long-life PVC shield and jacket of Ankoseal type 775-P-SS. It's designed especially for permanent installations.



Exchange cable (top) and rural distribution wire are both easy to install.

And for temporary service, you can't beat the speed and low-cost installation of Ankoseal Rural Distribution Wire. Individual color-coded conductors, insulated with polyethylene with a PVC covering, are cabled around an insulated extra high strength galvanized steel support wire. There is no shield or jacket.

There's an Ankoseal self-supporting cable to meet each situation.

Distributed by

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 3, Chicago 6, Kansas City 8, Rochester 3, San Francisco 3.

late fall of this year, the new building will have outside dimensions of 85 by 77 feet. Including the basement, the two story brick building will have a total floor space of some 22,000 feet which is about four times greater than that of the existing building.

All equipment vital to telephone communication will be located well above ground level in view of hurricane and high water experiences in the past. The new building's equipment will include a permanent emergency power installation to provide electricity in event of commercial power failures.

In addition to providing space for new local dial and long distance equipment, the building will include space for the company business office.

Converting to the two-five numbering plan simultaneously with dial conversion, the new numbers will be assigned the name "Whitney". Tentative plans call for the new system to be placed in service in mid 1957.

General of N. W. Names Williamson to New Post

THE APPOINTMENT of Henry H. Williamson, Jr., to the position of district plant supervisor at Kennewick has been announced by Arthur B. Anell, central division manager of General Telephone Co. of the Northwest.

Williamson was formerly located at Moscow, Ida., where he held the position of chief equipmentman. A native of Nihill, Mont., he is a 1941 graduate of Coeur d'Alene high school and attended the University of Wisconsin and the Central Washington College of Education at Ellensburg.

He started with General of the Northwest as a lineman at Coeur d'Alene in 1947 and one year later was promoted to an equipmentman's job at the same exchange. He was transferred to Wallace, Ida., in 1950 and shortly thereafter went on a military leave of absence.

He returned to his former position at Wallace in 1951 and in 1953 was promoted to the position of chief equipmentman at Moscow, which he held until his recent appointment.

"It says—'Here lie the bones of Anthony Moore. Discriminatory taxes kept him poor!'"

A. T. & T. Names James Cook Vice Pres., Merchandising

JAMES W. COOK, vice president in charge of rates and revenues for the American Telephone & Telegraph Co., has been appointed vice president in charge of merchandising. Mr. Cook will succeed Bartlett T. Miller on his retirement. E. Hornsby Wasson, vice president in operations, A. T. & T., will take over the duties of Mr. Cook.

Mr. Cook began his business career in 1929, as a traffic student with New Jersey Bell. He later held various assignments in the A. T. & T. Company, the Pacific Telephone & Telegraph Co., and the Northwetsern Bell Telephone Co. in Omaha. He became operating vice president of the Northwestern Co. in 1953. A year later, Mr. Cook returned to A. T. & T. in his present capacity.

Mr. Wasson started in the telephone business in 1926 as a salesman for Southern Bell Telephone Co. in Chattanooga, Tenn. He was appointed general commercial manager in 1947. Three years later, Mr. Wasson became vice president, public relations of the Northwestern Bell Company in Omaha and the following year was placed in charge of the company's Minnesota area. He was named vice president of A. T. & T. Co. in 1952 and assumed his present duties in April 1955.

Lincoln Tel. & Tel., Reports Record Growth for '55

THE BEST YEAR in the history of The Lincoln (Neb.) Telephone & Telegraph Co. was reported last month by Thomas C. Woods, president, at the company's annual stockholders' meeting. LT&T gained 5,592 telephones in 1955, which was 1,303 more than was gained in 1954. At year-end it was operating 123,385

telephones, a 63 percent in increase in the last 10 years.

Operating revenue for the year totaled $10,328,948, an increase of $670,525 over 1954. Operating expenses for the year, not including taxes, totaled $6,856,103. Woods said the increase in operating revenues was the result of growth in telephones and increased usage of long distance service.

Federal income taxes for the year amounted to $1,124,000 and state and local taxes totaled $755,970. Including federal excise taxes paid directly by customers, the total taxes on the company's service for the year amounted to $1.93 per month for every telephone in service.

Reflecting the company's growth through the year, net additions to plant were made in the amount of $1,775,257. At year-end the total plant in service had a value of $33,005,409 and plant under construction was $317,093. Average plant in service per telephone increased from $262.48 at the end of 1954 to $266.03 at the end of 1955.

Work was begun on the construction of a new office and equipment building at Beatrice and the conversion of the exchange to dial operation. This conversion is scheduled for early in 1957 and will provide facilities for the dialing of long distance calls by customers, the first such installation in the state. Beatrice is the company's third largest exchange and serves 5,380 telephones.

Major additions to central office equipment and cable distribution facilities were made at Lincoln, Hastings, Beatrice, Humboldt, Nebraska City and a number of other exchanges. A total of 26 additional long distance circuits were installed during the year.

Mr. Woods announced the election of the following directors: E. J. Faulkner, president, Woodmen Accident & Life Co., Lincoln; Morton Steinhart, president, Otoe Food Products Co., Nebraska City; and T. H. Wake, president, Jones National Bank, Seward.

The directors of the company re-elected were: Thomas C. Woods, Merle M. Hale, H. W. Potter, Frank H. Woods, Jr., Mark W. Woods, Charles T. Stuart, William I. Aitken, George J. Woods, Philip M. Aitken, John H. Agee, W. W. Putney, L. E. Hurtz and Henry C. Woods.

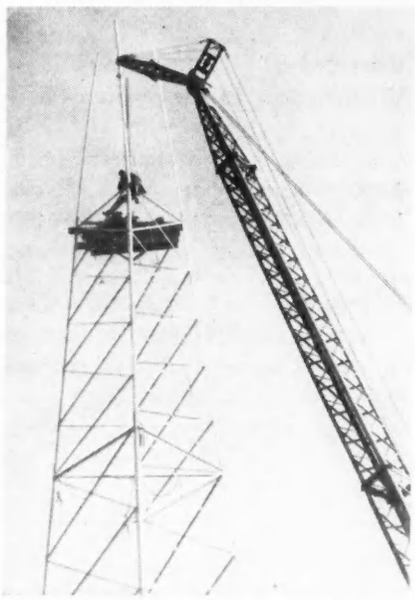
The annual directors meeting followed the stockholders meeting. Corporate officers re-elected were: Thomas C. Woods, president; Merle M. Hale, vice president; Houghton Furr, secretary and treasurer; and I. J. Devoe, controller. Operating officials reappointed were: K. L. Lawson, general commercial superintendent; G. P. Barney, general plant superintendent; L. P. Young, general traffic superintendent; P. H. Henson, chief engineer; and W. F. Roberts, personnel director.

Clifton W. Phalen Elected Exec. Vice Pres. of AT&T

CLIFTON W. PHALEN was elected an executive vice president of American Telephone and Telegraph Company by the Board of Directors at their meeting on February 15.

Mr. Phalen, who has been President of the Michigan Bell Telephone Company, assumed his new post on March 1. He will assist the president in the overall operation of the business and perform such other duties as the president may assign him.

Born in Washington, D. C., and a graduate of Yale University, Mr. Phalen has spent his entire business career in the Bell System. He started in 1928 as a lineman for the New York Telephone Company in Syracuse, New York, and after filling various assignments in the Plant Department he was appointed Division Plant Superintendent at Albany in 1939. In 1943 he became Assistant Vice President of Personnel, in 1944 he was made Vice President Personnel and in 1945 Vice-President Public Relations, all with the New York Company. In 1948 he was elected Vice President of the American Telephone and Telegraph Company serving first in charge of Public Relations, then in charge of Rates and Revenues, and later in charge of Personnel Relations. He was elected president of the Michigan Bell Telephone Company September 1, 1952.



Workmen hoisting one of the top sections of a 100-foot, self-supporting microwave tower. The installation is a part of a microwave system to be placed in service by South Carolina Continental Telephone Co., to provide long distance telephone facilities between Bishopville and Sumpter, S. C. A similar tower has been completed at Bishopville. The system will operate in the ultra high frequency band and will initially provide 12 circuits, which may be expanded as required.

Gordon Saunders, president of the company, said the system is scheduled to be placed in service co-incident with the cutover of the Bishopville exchange, from manual to dial operation, scheduled for May of this year.

General of Michigan Announces Record Budget

A RECORD BUDGET totaling $3,983,900 for 1956 was announced last month by General Telephone Co., of Michigan's President, L. H. Meyer. Initiating an accelerated program of improvement and expansion throughout its 29-county operating area, Meyer stated that General of Michigan has experienced its greatest growth in 1955 of any year since 1932. During the last decade, the company has doubled the number of stations served. On January 1, 1945 the company listed 54,344 stations compared to 109,029 stations as of January 1, 1956, an increase of over 100%.

The multimillion-dollar budget is ear-marked for construction with 38 percent allocated to outside plant modernization and expansion. Central office equipment will require 20 percent, station equipment 32 percent, land and buildings, 5 percent, and all other equipment items getting 5 percent. Included in the budget are six dial conversions.

Stanley Gilbertson Joins A. G. Kiesling Acctg. Firm

A. G. KIESLING, certified public accountant and telephone consultant, Madison, Wis., has announced that Stanley E. Gilbertson, a certified public accountant, Arlington Heights, Ill., will be associated with him in the firm of Kiesling & Gilbertson,

certified public accountants for utilities. Prior to joining Mr. Kiesling, Mr. Gilbertson was employed by Arthur Andersen & Co., Chicago, Ill., a national public accounting firm.

Since his graduation from the University of Wisconsin in 1947, where he majored in accounting, Mr. Gilbertson has specialized in accounting and related problems of public utilities. For the past four years, he has worked in the Public Utility Division of Arthur Anderson & Co., and has

STANLEY E. GILBERTSON

been engaged in accounting activities in connection with financing, regulatory and auditing and system installation work for various telephone, electric and gas companies in the middle west.

Prior to joining Arthur Anderson & Co., Mr. Gilbertson was employed by the General Telephone System in various capacities with the Wisconsin, Illinois and Pennsylvania companies. His work as assistant secretary and treasurer of General Telephone Co. of Pennsylvania was interrupted by a recall to active duty in the United States Army during the Korean War. During this period he served on the General Staff at the Pentagon, Washington, D.C. where he received official commendation for his contributions to the supply and procurement activities of the Army.

Mr. Gilbertson, 32, was born in Black River Falls, Wis., and attended schools in that city and in Wausau, Wis. He graduated from the University of Wisconsin at Madison in 1947 after serving as an Infantry Officer in the European Theater during World War II.

in any emergency!

LOWELL WIRES GET THE CALL THROUGH

The technical staff at Lowell Insulated Wire Company uses many physical tests to determine the effect of heat, aging, tensile strength, compression, cold, acids, oils, moisture and abrasion. They also employ extensive electrical tests. To create the maximum performance and dependability which is characteristic of Lowell Insulated Wire, many factors have been combined in a well balanced and efficient manufacturing process. That is why through long years in actual service Lowell Wires maintain a record for reliability and low maintenance or replacement costs. Write today for details.

"FINE WIRES ONLY"

DROP WIRE — neoprene jacketed, rubber insulated — between buildings and open wire telephone line.
BRIDLE WIRE — neoprene jacketed —link between drop and inside wires.
DUCT WIRE — plastic insulated — used inside buildings for connecting outside circuits to station sets.

LOWELL INSULATED WIRE DIVISION
OF The Overlakes Corporation
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Neoprene Jacketed, Rubber Insulated Drop Wire, with Bronze, Copperweld or Copper conductors, Brass flashed or tinned — Neoprene Jacketed Outside Distributing Wire — Tree Wire — Plastic Insulated Inside and Duct Wire — Jumper and Distributing Frame Wire — Glazed Braided Inside Wire.

SUPPLIERS' NEWS BRIEFS

U. S. Motors Names Schultz Western Regional Manager

UNITED STATES MOTORS CORP., Oshkosh, Wisc., has announced the appointment of Robert L. Schultz as Western Regional manager.

Mr. Schultz will make his office in San Francisco, Calif., and have charge of United States Motors Corporation's operations in the Western States, Honolulu and Alaska. His duties will include the establishment and training of distributors and dealers; the supervision of government and utility contacts; and technical liaison with architects and engineers.

ROBERT E. SCHULTZ

Mr. Schultz is a graduate of Yale University and a member of A.S.M.E. and S.M.P.E. Prior to going to U. S. Motors Corporation, Mr. Schultz was associated with RCA as district manager in the theatre equipment section of the Engineering Products Division.

Architect FRANK LLOYD WRIGHT (center) discusses preliminary plans for the Lenkurt Electric Co.'s proposed new administration and engineering building in San Carlos, Calif. with Lenkurt's President L. G. ERICKSON (right) and Executive Vice President KURA E. APPERT. The famous architect will design the 90,000-square-foot building for the Lenkurt Company.

O. R. Roach Retires; Plans Consulting Service

O. R. ROACH is retiring as consulting engineer for the Gary Group of telephone companies. He has had 46 years of service in the field of telephone plant operations.

He started with the Southwestern Bell Telephone Co. at Oklahoma City and worked for a period of 23 years in all five states of Southwestern territory. His duties during this period were broadly student engineer, engineer, toll plant engineer, plant engineer for Kansas and later Oklahoma, plant supervision for Texas, and finally division plant superintendent for the south east Texas division with headquarters at Houston.

In 1932 Mr. Roach joined the Gary Group and became general plant superintendent for four companies in Illinois. In 1945 he moved to Fort Wayne, Ind. and became a consulting engineer. His duties were those of an engineering consultant largely with the Continental Telephone Companies, the Community Telephone Companies and the Middle States Utilities Companies. These companies covered areas in 17 states.

Roach plans to continue to do con-

sulting work for various Independent telephone companies. He has bought a home in Fort Smith, Ark. at 2307 South 23rd St. and plans to work out of Fort Smith.

Business Kit Available From Automatic Electric

A "NEW-BUSINESS" KIT is available free from Automatic Electric Co., 1033 W. Van Buren, Dept. TEM, Chicago 7, Ill.

Designed primarily for the telephone man who wants to build his revenues but lacks the necessary materials and the assistance of full-time promotion experts, this kit gives him everything he needs to start and maintain a promotional program that will help him sell more telephone services of all kinds.

The kit includes: (1) A guide book titled, "Ideas for Building Business," that contains a complete plan for setting up sales training, publicity, newspaper advertising, direct mail, displays and signs, and lists items that have proved successful for other telephone men; and (2) advertiing literature, newspaper ads, and publicity releases for use in a comprehensive promotional program.

Cook Electric Co., Chicago, has appointed MILTON VAIL as sales engineer with the Wirecom Division according to William C. Strehl, sales manager of the division. He will serve the Independent telephone industry throughout the southwest and middlewest states.

Mr. Vail previously was with Kellogg Switchboard & Supply Co., Western Light & Telephone Co., and Suttle Equipment Co. For the last six years, he was owner and operator of Christian County Tel. Co., Ozark, Mo.

Kellogg Names Douglas Mgr., Swbd. Sales Dept.

JOHN S. DOUGLAS has been named manager of the Switchboard Sales Department of Kellogg Switchboard & Supply Co., a Division of International Telephone & Telegraph Corp.

Mr. Douglas joined the Kellogg company in March, 1955, as an export sales engineer. He was appointed acting manager of the Export Department in August, 1955. He will supervise the sale of Relaymatic, Crossbar, PBX and PABX telephone equipment. His duties as acting manager of the Export Department will continue.

JOHN S. DOUGLAS

From 1946 to 1948, following a stint with the U. S. Navy, he served as sales manager for Berg Gibson Manufacturing Co., manufacturers of fast chargers.

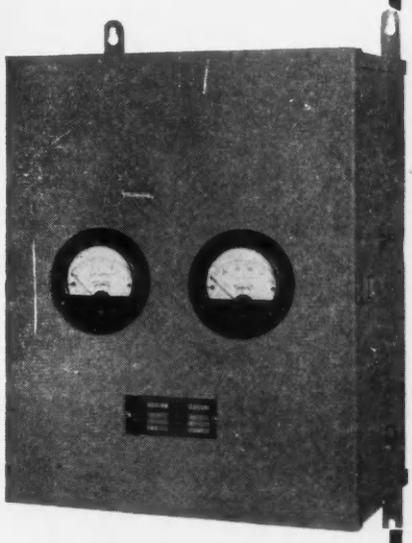
In 1948, Ash bought an interest in the Diller Battery Corp., Des Moines, Iowa, finally becoming sole owner two years later. He headed the Diller company four years until he sold out in the fall of 1954.

R. M. Ash Made Kansas City Salesman For C & D Batteries

ROBERT M. ASH has been named sales and service representative for C & D Batteries in the Kansas City area, the company announced. Ash, with a law degree from the University of Minnesota, brings to the new post nearly a quarter century of experience in the battery business and related fields.

For 10 years, Ash was associated with Gould-National Battery Co., first in its legal department, and then as assistant to the vice president handling battery sales programs in the east and midwest.

for Years-
and Years-
and Years-
of Service!



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ELECTROX
BATTERY ELIMINATORS
BATTERY CHARGERS

In sizes and capacities to meet every telephone power requirement.
See your Schauer Jobber.
Write for Bulletin 4516.

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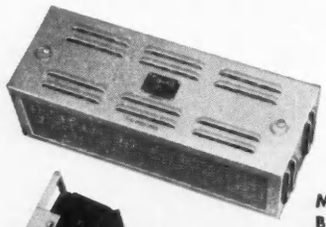
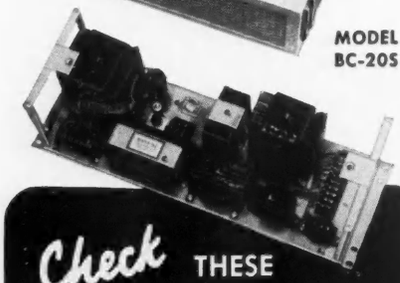
SUB-CYCLE

your Best Bet for any Kind of RINGING



MODEL BC-20S



Check THESE MONEY-SAVING FEATURES:

- √ NO MOVING PARTS TO WEAR OUT
- √ NO CROSS RINGING DIFFICULTIES
- √ REGULATED RINGING VOLTAGE
- √ BUILT TO HANDLE TOUGH JOBS
- √ ECONOMICAL ON CURRENT
- √ PERMANENT, MAINTENANCE-FREE OPERATION

JUST INSTALL A SUB-CYCLE AND FORGET IT!

With our line of Sub-Cycles, we are in excellent position to meet the requirements of the most exacting engineers in providing ringing machines for the modern telephone plant. Let Lorain furnish you with the proper ringing facilities.

A COMPLETE LINE OF SUB-CYCLES FOR MULTI-FREQUENCY RINGING:
SYNCHROMONIC - HARMONIC
DECIMONIC
RELAY START SUB-CYCLES
STANDBY GENERATORS
"R-T" UNITS FOR PBX AND SMALL SWITCHBOARDS
BIASED CORE SUB-CYCLES

LORAIN PRODUCTS CORPORATION
1122 F STREET LORAIN, OHIO

FLOTROL PARTNERS IN DEPENDABILITY SUB-CYCLE

Kellogg Names Robertson To New Sales Position

J. T. ROBERTSON has been named assistant sales manager for the Kellogg Switchboard & Supply Co., a Division of International Telephone & Telegraph Corp., according to an announcement by W. P. Hollis, sales manager.

Mr. Robertson, Kellogg's former North Eastern Division manager,

J. T. ROBERTSON

will supervise the sale of telephone products manufactured by Federal Telephone & Radio Corp.

Mr. Robertson, active in foreign and domestic telecommunications for over 18 years joined the Kellogg company in 1951 as a Crossbar equipment engineer. In 1952 he was assigned to the Chicago sales office as a sales engineer. His most recent position was as North Eastern Division Manager. His home office will be at 100 Kingsland Road, Slifton, New Jersey.

Wheelock Signals, Inc. Advances Frank McKenna

THE APPOINTMENT of Frank A. McKenna to the position of field application engineer has been announced by Wheelock Signals, Inc., Long Branch, N. J. He will represent the company in the New Jersey and Eastern Pennsylvania areas.

Mr. McKenna has been with the company for over seven years as chief laboratory engineer, during which time he has been responsible for the testing of all new developments and the solving of development problems for special applications. Prior to that time, he spent

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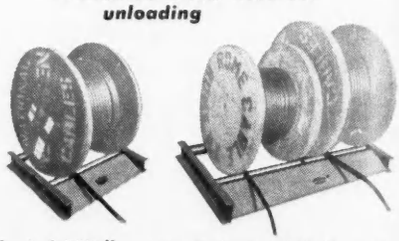

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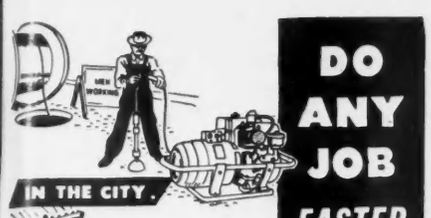
UNITED UTILITIES, INCORPORATED
44th Consecutive Dividend

The Board of Directors declared a quarterly dividend of 30 cents per share on the outstanding common capital stock of the company, payable on or before March 31, 1956, to stockholders of record at the close of business March 13, 1956.

Abilene, Kansas March 1, 1956
ALDEN L. HART, President



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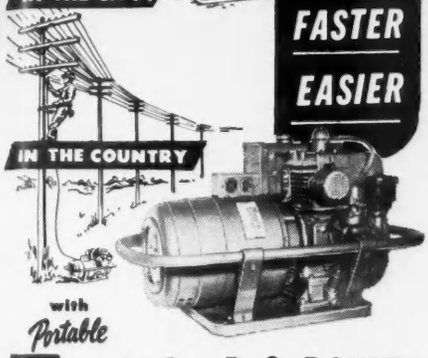

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FRANK A. McKENNA

two years with Federal Telephone & Radio Corp., in the telephone apparatus design section.

From 1942 to 1945 he worked for the Army Signal Corps and the Air Corps as inspector in charge at various manufacturing plants including Connecticut Telephone & Electric Division, Holtzer-Cabot, Harvey Radio, Cambridge Thirmionics, Stromberg-Carlson, and L. C. Smith & Corona.

Mr. McKenna holds a Bachelor of Electrical Engineering degree from Manhattan College, Class of 1942. He is a member of several technical associations.

Pat Morrisey Joins Federal Tel. & Radio Co.

FEDERAL TELEPHONE & RADIO CO., Clifton, N. J., a division of International Telephone & Telegraph Corp., has announced the appointment of Pat J. Morrisey as sales manager for the Transformer Department, Components Division.

Morrisey has been in the electronics and electrical fields for the last 17 years in various sales and service capacities. Prior to joining Federal, he was industrial sales manager of Gramer Halldorson Transformer Corp., Chicago, and previously was a division sales manager with Sola Electric Co., Chicago.

Morrisey is a veteran of World War II, and spent much of his war time in radar work. In his new position he will supervise all transformer sales functions throughout the 48 states, and handle the appointments of representatives. He is a member of the Instrument Society of America,

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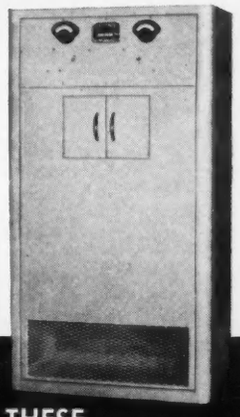

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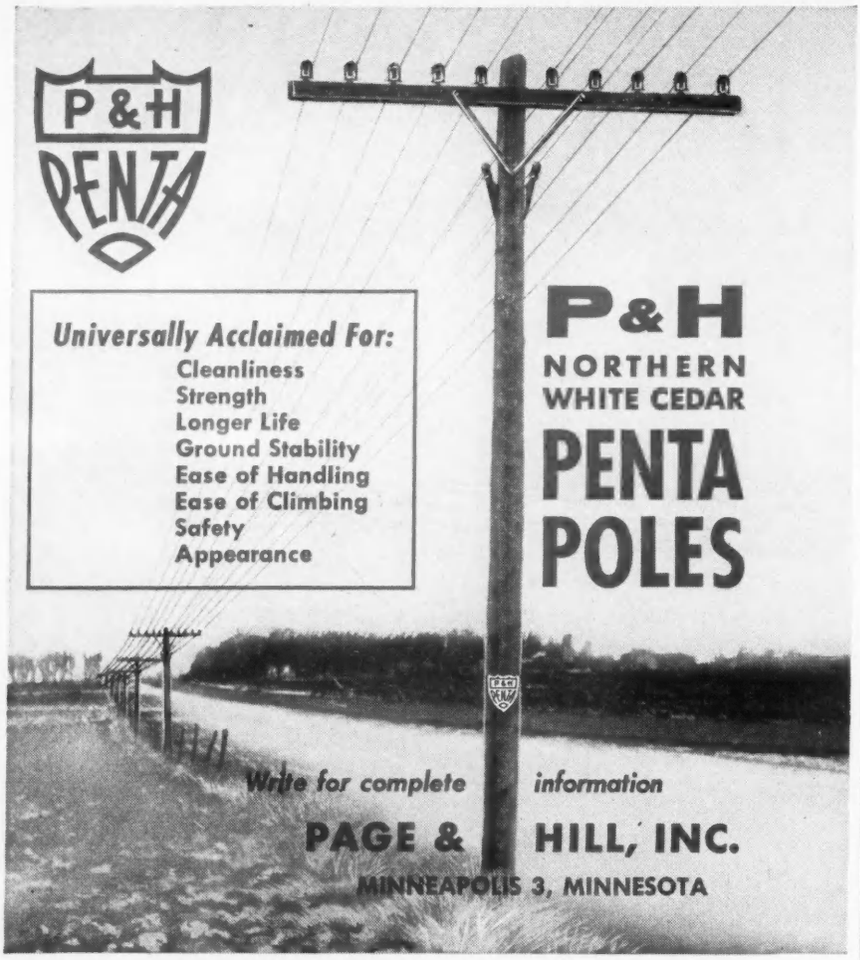

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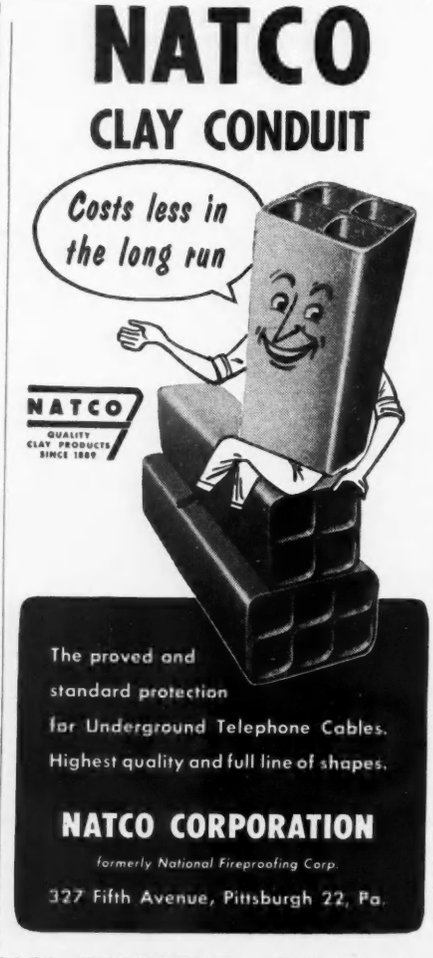
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and the Illuminating Engineering Society. He has attended Loyola University, Oklahoma A&M, and the Massachusetts Institute of Technology, as well as the top secret radar schools of the U. S. Navy. Currently making his home in Hinsdale, Illinois, Mr. Morrisey expects to locate in Cedar Grove, N. J.

Roy J. Gavin Named V. P. Irvington Varnish & Insulator

PROMOTION of Roy J. Gavin to vice president and general manager of the Irvington Varnish & Insulator division of Minnesota Mining & Manufacturing Co., St. Paul, Minn., and the retirement of Arthur E. Jones, Irvington president, has been announced by H. P. Buetow, 3M president.

Gavin, who has been vice president of the division since 1953, will succeed Jones as Irvington's top executive. Before becoming associated with Irvington, Gavin was sales manager of 3M's magnetic recording tape division for five years. He joined 3M in 1944.

As president since 1922, Jones' leadership made Irvington one of the outstanding producers of electrical insulation. Because of his broad experience in this field, he will continue as a general consultant on both Irvington and 3M problems.

Irvington became a part of the 3M organization in August, 1953. It is best known for its wide lines of insulating varnishes, varnished cloths and extruded plastic insulators, resins and bottle cap liners.

Copelin Elected V. P. Int'l Standard Elec.

JOHN G. COPELIN has been elected vice president, comptroller, and a director of International Standard Electric Corp., New York City, holding and management company for the foreign manufacturing and laboratory subsidiaries of International Telephone & Telegraph Corp.

Mr. Copelin comes to ISE from Federal Telecommunication Laboratories, U. S. research division of IT&T, where he was vice president, comptroller, and a member of the management advisory board. Since joining the IT&T comptroller's department in 1928, he has had other important assignments with the corporation's manufacturing and operating companies. During World War II, he was on loan to Litton

Engineering Laboratories, Redwood City, Calif., where he served as general manager for three years.

Mr. Copelin is a member of the Controllers' Institute of America, the Armed Forces Communications and Electronics Association, and the American Ordnance Association.

New Location For MSI Communication

MSI COMMUNICATIONS Consulting Engineers, formerly Microwave Services, Inc., has moved to new and larger quarters in the Times Tower Bldg., Times Square, New York 36, N. Y.

In order to reflect the expanded scope of its activities in all phases of communications, the more descriptive name of MSI Communications Consulting Engineers will be used in preference to Microwave Services Inc., which is retained primarily as the legal corporate name.

Kellogg Names Williamson Mgr., Industrial Sales Dept.

R. H. WILLIAMSON has been named manager of the Industrial Sales Department of Kellogg Switchboard & Supply Co., a division of International Telephone & Telegraph Corp., according to an announcement by W. P. Hollis, sales manager.

Mr. Williamson joined the Kellogg company in 1953 as an industrial

R. H. WILLIAMSON

application engineer. In August, 1955, he was appointed acting manager of the industrial sales department.

Prior to joining Kellogg, Mr. Williamson was a service engineer for the International Business Machine Corp. In his new capacity as Manager of the Industrial Sales Department, he will supervise the sale of Kellogg products to the Industrial Field.

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Photograph courtesy Lincoln (Neb.) Telephone and Telegraph Co. and Automatic Electric Sales Corp.

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Electrical Communications Expands Service Facilities

EXPANSION of facilities for the design and fabrication of special communications and industrial control equipment by Electrical Communications, Inc., 765 Clementina St., San Francisco 3, Calif., has been announced by Eric Cogill, president.

Since the company was founded almost 30 years ago, it has provided a service to railroads, pipe lines, electric utilities and other operators of communications systems as well as equipment makers. The company has designed special telephone switchboards, industrial sound systems, intercommunicating systems, selective ringing and signaling systems for telephone and teletype systems, coded electrical security systems and special apparatus for use with telephone and telegraph carrier systems, power line carriers, microwave and mobile radio systems.

The company manufactures Secode selectors as well as apparatus utilizing these selectors. A new selective calling system was recently announced which permits base station operators to dial-call individual mobile units and in addition permits drivers to dial-call other mobile units and even to dial directly into land based private telephone systems without the aid of an intermediary operator. A decoder is being developed which is responsive to the two-tone code used by Bell.

In expanding its services, Electrical Communications, Inc., has appointed engineering representatives in key cities to call on customers to determine their special requirements. Robert B. Moon, former general sales manager for Hammarlund and earlier, assistant general sales manager at Bendix Radio, and his associates, W. C. King, serve as engineering representatives on the West Coast. Moon has had extensive engineering experience. W. L. Cunningham, former Bendix railroad sales manager, is the Chicago engineering representative.

The laboratories and shops of Electrical Communications, Inc. are equipped to design and fabricate apparatus in prototype and modest production quantities to industrial and military specifications.

"We have the basic components already developed and have the telephone engineering experience to design comprehensive control systems for wayside-to-train and other right

of way radio communications systems" Cogill said "which will require a minimum of tampering with existing dispatching equipment. We can also extend selective signaling to individual trains and other vehicles as well as facilities for positive identification of trains at the dispatcher's office by automatic means."

Kellogg Swbd. Names Hopper Div'n. Mgr.

W. C. HOPPER has been named North Eastern Division Manager of the Kellogg Switchboard & Supply Co., a division of International Telephone & Telegraph Corp., according to an announcement by C. C. Bailey, assistant sales manager.

Mr. Hooper joined Kellogg in 1952 as REA switchboard sales supervisor and assistant manager of the Switchboard Sales Department. His most recent position was as a field representative in Kellogg's North Eastern

W. C. HOPPER

Division. He began his career with the Bell System gaining 15 years experience in sales and commercial activities before joining the Western Electric Co. Throughout World War II his work was principally connected with Signal Corps problems. From 1945 to 1950 Mr. Hopper was active as sales engineer in dial conversions for another telephone manufacturing company.

Prior to joining Kellogg, Mr. Hopper was in the Application & Loan Division of REA in charge of telephone loan activities for the south eastern states. His home office will be at 100 Kingsland Road, Clifton, New Jersey.

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Stromberg-Carlson offered me and my family so much more than a good salary, plus bonus and a flock of fringe benefits, that I couldn't say anything but *"When do I start?"*

There's the Company itself—sixteen times bigger today than in 1940—and now a division of the headline-making General Dynamics Corporation. One look at its Research Lab alone convinced me that here is probably the "hottest" electronics industry in America today.

There's Rochester, and its surroundings. Right in the heart of the Finger Lakes; only four hours from the Adirondacks. Home of the Eastman School of Music and Eastman Theatre; of world-famous parks; of no less than thirteen golf courses; of schools and shopping centers unrivalled in the East; of scientific industries whose engineers turn up as your next-door neighbors.

Above all there's *opportunity*. As the chap who hired me put it, "This is the spot for men who are either stymied in a little company, or buried in a giant." More than twenty fields of employment are open—as shown by the list to the right.

***I* started with a detailed letter of inquiry to Howard L. Foote, at the address below. Why don't you do the same?**

- Audio Amplifiers
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- Automation
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- Countermeasures
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- Digital Techniques
- Electro-mechanical Design
- Electronic Carillons
- Electronic Switching
- Infrared
- Intercom Systems
- Laboratory and Test Engineering
- Loudspeaker
- Magnetic Tape Recorders
- Microwave, communication
- Navigational Systems
- Radar
- Telephone Switching Technique
- Transistor Engineering
- Voice communication
- Writers—Bid Proposal
- Writers—Technical

P.S. Look us up at the March I.R.E. show in New York City

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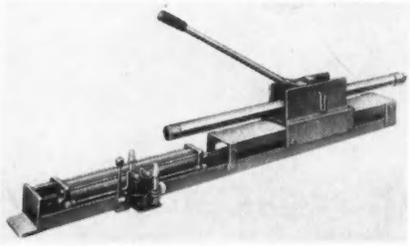


Pipe Pusher

MECURY HYDRAULICS, INC., recently introduced its new "Speed-Thru" Pipe Pusher. The pipe pusher, completely power operated by one man handling two controls, features a continuous 21-inch hydraulic power push or pull of pipe from ¾″ to 8″ diameter. The unit is delivered complete with gas engine, DC truck power or AC electric hydraulic power unit, as desired, equipped with 25 foot hydraulic pressure and return hoses, furnished with quick coupler attachments, and dust caps and dust plugs. Pushing and pulling is done with the machine installed in pushing position, and operation is without change of pressure or speed.

Mercury Hydraulics offers affidavits supporting five years of performance on contract pipe pushing jobs, during which time patents were perfected. Pushes of 75 feet of 2 and 3-inch pipe in 18 minutes through hard shale and hard pack road bed are recorded. Longest pushes required were 120 feet and 186 feet, delivered with less than 8 inches deviation, according to the manufacturer's records.

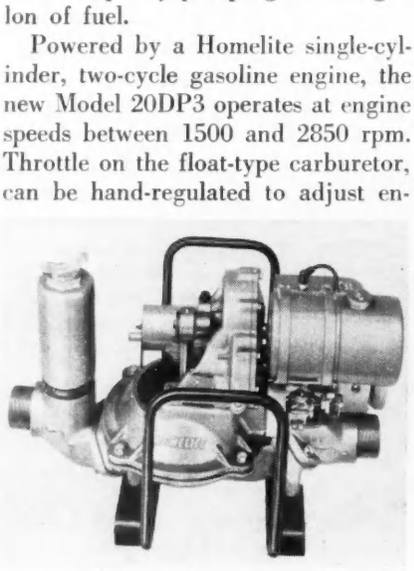
Pipe pulling is accomplished by simply reversing the forward pushing principle, enabling fast withdrawal and resetting to new position if hidden obstructions prevent completion of a push.

For descriptive literature, ***Check New Product* 911.**

Diaphragm Pump

ALL HEAVY-DUTY PUMPING — mud, muck, sand and sewage — is handled by a new diaphragm pump announced by Homelite, Port Chester, N. Y. With a pumping capacityy of 5,000 gallons per hour, the new Model 20DP3 weighs only 120 pounds. Simple, compact design makes it possible to set up pumping operations quickly — in any location. Economical to operate, the new 20DP3 will run 6 hours at full capacity pumping on *one* gallon of fuel.

Powered by a Homelite single-cylinder, two-cycle gasoline engine, the new Model 20DP3 operates at engine speeds between 1500 and 2850 rpm. Throttle on the float-type carburetor, can be hand-regulated to adjust engine speed for different pumping conditions — slow speed for seepage control, full speed for capacity pumping.



By using all anti-friction bearings and all heat-treated, cut steel gears in the pump end, wear and maintenance costs on the 20DP3 are held to a minimum.

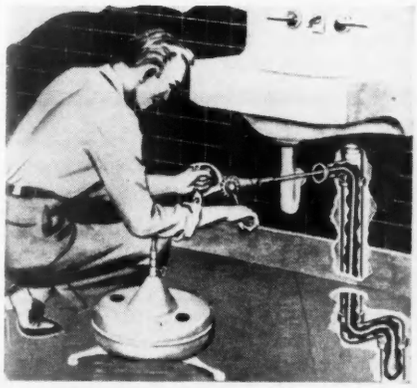
Completely self-priming, the 20DP-3 will dry-prime up to 15 feet and do it in 15 seconds! Pumping capacity of the 20DP3 is 5,000 gallons per hour; guaranteed suction lift — 28 feet; and total head — 50 feet, including friction. Supplied with 3″ fittings, the 20DP3 can be adapted for use with 2″ hose. For further information, ***Check New Product* 912.**

Telescoping Pole

UTILITY LINE REPAIR men have a safer, easier job today, thanks to a new telescoping, fiberglass "hot stick," adapted from a fishing pole by Orchard Industries, Inc., Hastings, Mich. The new tool makes it unnecessary for the lineman to climb utility poles to perform many high-danger jobs.

The Extendo "hot stick" telescopes from a four and one-half foot length to twenty-eight feet and weighs less than seven pounds. Hooks, wrenches, saws, brushes and other specialized tools and accessories clamp into the business end of the hot stick. Completely non-conductive, the Extendo fiberglass pole is also finding wide

use with fire and police departments for emergency handling of live wires. —For complete data. ***Check New Product* 913.**



Pipe Cleaning Unit

THE MILLER Rod House unit is designed for quickly cleaning out stubborn drain and sewer stoppages. The unit makes it possible to clean out clogged toilets, wash basins, and floor drains up to 100 feet in length. Yet is is easy to operate; turn the speed handle and the rod is whirled down the pipe cleaning out rags, scale, sand, grease, and other obstructions.

The Miller Rod House is manufactured by the Miller Sewer Rod Co., 4640 North Central, Dept. TE&M, Chicago 30, Ill. Free catalog is available.—***Check New Product* 914.**

Flux Pot

THE HELMCO-LACY flux pot, a new unit specifically designed and manufactured for warming and controlling brazing and soldering flux, has been marketed by Helmco, Inc.

This new unit is the first ever produced specifically to warm and maintain soldering and brazing flux at a constant and efficient holding temperature.

The Helmco-Lacy Flux Pots are manufactured in two sizes, holding five and slightly over 10 pounds of flux. Exteriors are of easy-to-clean satin-finish aluminum. Highly glazed vitreous enamel bowls prevent contamination of the flux. Heating elements are completely insulated to insure perfect operation and a dial thermostat allows temperature setting adjustments and perfect control. — For complete data. ***Check New Product* 915.**

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ADV. 16..... ADV. 17..... ADV. 18..... ADV. 19..... ADV. 20.....
ADV. 21..... ADV. 22.....

THE BUYERS' GUIDE

ADVERTISING, Directories — *General Telephone Directory Co., 1800 Busse Highway, Des Plaines, Ill.*—[ADV. 1]

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*—[ADV. 2]

BELTS — CLIMBERS — PLIERS — SAFETY STRAPS — CONSTRUCTION TOOLS. *Klein & Sons, Mathias, 7200 McCormick Rd., Chicago 45, Ill.*—[ADV. 3]

BOOTHS—Acoustic Telephone — *Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.*—[ADV. 4]

BRUSH & WEED KILLERS — *Thompson manufactures many types of brush and weed killers. Write for helpful information on specific problems. Thompson Chemicals Corp., St. Louis 3, Mo.*—[ADV. 5]

CABLE, All Plastic, Aerial, Duct, Direct Burial, PBX, Switchboard. — *The Ansonia Wire & Cable Co., Ansonia, Conn.*—[ADV. 6)]

CORDS, Switchboard (with or without plugs), Instrument (retractable and regular) and Operators — *Commercial Cord & Supply Co., Inc., 26 Main St., Clifton Springs, N. Y.*—[ADV. 7]

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*—[ADV. 8]

FURNACES — **For quickly and economically melting lead and paraffin** — *Mutual Liquid Gas Equipment Co., Inc., 3600 W. Imperial Highway, Los Angeles, Calif.*—[ADV. 9]

INSULATORS, Porcelain — *Porcelain Products Inc., Box 300, Findlay, Ohio.*—[ADV. 10]

LIGHTWEIGHT PULLERS — *Coffing Hoist Company, 800 Walters St., Danville 5, Ill.* — [ADV. 11]

PIPE PUSHERS — *Giant Manufacturing Co., South 6th St., at 12th Ave., Council Bluffs, Iowa.*—[ADV. 12]

POLE HOLE DIGGERS — *For derrick mounted trucks. Tele-E-Lect Products, Inc., 9613 Minnetonka Blvd., Minneapolis 16, Minn.* —[ADV. 13]

POLES, Southern Yellow Pine — *Colfax Lumber & Creosoting Co., Inc., P. O. Box 23. Pineville, La.*—[ADV. 14]

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 290 E. Main St., Spartanburgh, S. C.*—[ADV. 15]

POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*—[ADV. 16]

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 3145 Carroll Avenue, Chicago 12, Ill.*—[ADV. 17]

REBUILT TELEPHONES & SWITCHBOARDS — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 26, Ill.*—[ADV. 18]

TRUCK BODIES — *Highway Trailer Co., Edgerton, Wisc.*—[ADV. 19]

WIRE, Insulated — DATED DROP WIRE — Neoprene or Weatherproof — *Alphaduct Wire & Cable Co., Milltown, N. J.*—[ADV.. 20]

WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket. R. I.*—[ADV. 21]

WIRE, Telephone, for all inside and outside uses — *Whitney Blake Co., New Haven, Conn.*—[ADV. 22]

EMPLOYEES
POSITIONS
SERVICES

THE CLEARING HOUSE

FOR SALE
OPPORTUNITY
EQUIPMENT

Published in each issue of Telephone Engineer & Management. Advertising forms close on 1st of month. Rates 15 cents a word except for Situation Wanted ads, which are only 10 cents per word. In figuring cost of ads, count each word of address in number of words used. All ads payable in advance. Minimum charge—$2.00. Special rates for display ads on request. Send copy and box number replies to Telephone Engineer Publ-ishing Corp., 7720 N. Sheridan Road, Chicago 26, Ill.

POSITION WANTED

Husband and wife want manager and operators job. 10 years experience in magneto and dial equipment. Must be in southern Iowa territory. Write Mr. Dalbert Ramsey, Moravia, Iowa.

HELP WANTED

Exchange Engineering Positions

available for men with experience in a telephone exchange. Two years in installation or maintenance may be all you need to get started. If that is your background, get in touch with us. We'll welcome a man with a high school education (of course, a few years of college or communications course taken in military service won't do any harm). Positions are available in all phases of exchange engineering; tell us about your experience, and we'll find the place for you. We offer liberal salaries and benefits — and, in 1957, we'll have a new 98 multi-million dollar plant in a Chicago suburb, providing ideal working conditions. Start with us *now* — address:

Personnel Manager
Automatic Electric Company
1033 W. Van Buren
Chicago 7, Illinois

HELP WANTED

Experienced outside plant telephone engineer for sales engineering position. Large manufacturer. State qualifications and experience. Replies held confidential. Send complete resume to Box 9008, Telephone Engineer Publishing Corp., 7720 Sheridan Rd., Chicago, Ill.

GENERAL TRAFFIC SUPERINTENDENT — a man with experience in scheduling, force requirements and general supervision of toll center operations for an Independently-owned Company, with nine toll centers with operator toll dialing, and eight additional manual exchanges in process of conversion to dial. Company has 66 exchanges with 94,000 telephones, more than 92% dial operated. Opportunity in an operating company with a chance to grow. (Present Traffic Superintendent moving to California for family reasons.) Write Colonel Wm. C. Henry, General Manager, Northern Ohio Telephone Company, Bellevue, Ohio, giving pertinent information and summary of past Traffic Department experience.

HELP WANTED

"Man under 35 to assist consulting engineer in field work and office design of telephone outside plant and exchange equipment. Previous experience required. Box 2984, Raleigh, N. C."

CENTRAL OFFICE EQUIPMENT MEN

Northern Ohio Telephone Company of Bellevue, Ohio, with 66 exchanges in Northern half of Ohio, offers steady employment at several of its District Headquarters exchanges. Fixed location, home each night (except in an emergency), automatic wage progression, holidays with pay, pension benefits, sick pay and hospitalization, with an operating company interested primarily in improving its service to over 93,000 subscribers. Write Eugene Alexander, Equipment Superintendent, Bellevue, Ohio, setting forth your experience and qualifications.

CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 6100 N. 20th, Philadelphia, Pa.

EQUIPMENT INSTALLER and equipment maintenance man wanted. Permanent position with Class A northern California company. Send letter with details of your experience to Box 9003, Telephone Engineer Publishing Corp., 7720 Sheridan Rd., Chicago, Ill.

EQUIPMENT ENGINEER wanted with ability to engineer carrier and switchboard additions. Excellent opportunity with Class A company on West Coast. Send full resume first letter to Box 9002, Telephone Engineer Publishing Corp., 7720 Sheridan Rd., Chicago, Ill.

OUTSIDE PLANT ENGINEER wanted to take charge of all engineering for Class A company in northern California which includes 22 exchanges. Excellent opportunity for man with ability to plan and direct activities of field engineering personnel. Knowledge of carrier and switchboard equipment desirable. Reply sending complete resume to Box 9004, Telephone Engineer Publshing Corp., 7720 Sheridan Rd., Chicago, Ill.

CHIEF OUTSIDE PLANT ENGINEER for permanent position in Alaska's largest and fastest growing community. Must have broad experience in all phases of outside plant engineering and be capable of assuming related administrative responsibilities. Submit complete resume of background first letter to Superintendent, City of Anchorage Telephone Department, Box 400, Anchorage, Alaska.

POSITIONS WITH A FUTURE

The rapid expansion of progressive Class "A" Company necessitates seeking talent beyond our own organization. Administrative and supervisory positions are now open for men having previous experience in Plant, Traffic, Commercial and rate case work. Please send complete summary of experience to Box 9011 Telephone Engineer Publ. Corp., 7720 N. Sheridan Rd., Chicago, Ill. All replies confidential.

HELP WANTED

Manager for progressive telephone Cooperative system located in west central section of Wisconsin. Expect 700 stations on conversion of 3 dial offices. Excellent rural areas, convenient to large cities. Applicant must qualify for complete management, have sound telephone background and ability to promote system growth and business security. Excellent chance for advancement. For application forms please write, Harold Kreutzer, Pres. West Wisconsin Tel. Cooperative, Inc. Box 142, Menomonie, Wisconsin.

Openings for
TELEPHONE SWITCHBOARD INSTALLERS

Prefer men experienced in analyzing circuits and installation work, must be willing to TRAVEL. Liberal expense accounts, excellent opportunity for advancement, many company benefits.
These jobs have been created by the expansion of this company. If you are looking for opportunity, GROW WITH NORTH.

Write to A. V. Ryon,
Director of Personnel,
NORTH ELECTRIC COMPANY,
GALION, OHIO
Phone 2-4201.

SALES OPPORTUNITY

Excellent opening in TELEPHONE SWITCHBOARD SALES for man with experience in telephone sales or engineering. Must have thorough knowledge of switching equipment. Ability to do basic engineering. Will be assigned permanent territory but must be prepared to relocate to the assigned area. Salary commensurate with ability, liberal benefits.
Write to Box 9012, Telephone Engineer Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Ill.

POSITION WANTED

POSITION WANTED: Man, middle fifties; over 30 years experience; C. O. and outside station repair, desires location Eastern Seaboard state. Available June 1st. Box 9006, Telephone Engineer Publ. Corp., 7720 Sheridan Rd., Chicago 26, Ill.

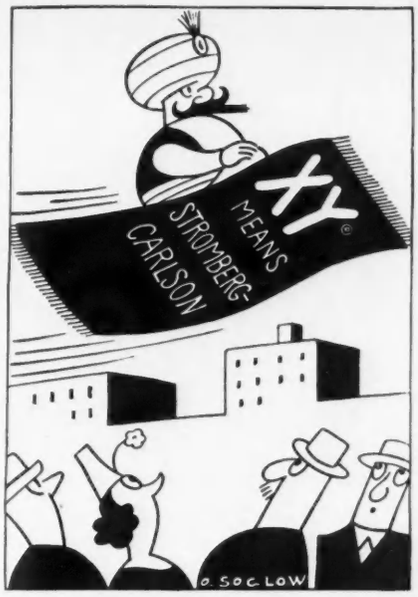
FOR SALE

LINE & CUT-OFF RELAYS

W.E. # A1 and A-2
W.E. # AB-4 and AB-6
S.C. #194-A and #193-BB
Kellogg #2029-CEY and #2048-SR
Kellogg #2029-SAH and #20.48-SR
Many Types Standard Relays
Reconditioned by

BUCKEYE
TELEPHONE & SUPPLY CO.

1250 Kinnear Rd., Columbus 21, Ohio



FOR SALE

Good USED Ford, Dodge and Chevrolet Line Trucks Five Man Cabs, Double and Single Drum Winch, and Boom Fully RECONDITIONED and PAINTED your Color $1,995.00.

Telephone Installer Trucks also available.

NEW PROSPECTOR and STERLING DIGGERS. Factory Rebuilt. Used Earth Boring Machines—ASK ANY OWNER about our NEW and USED Equipment.

WYOMING VALLEY EQUIPMENT DIV.
714 Wyoming Avenue
Kingston, Pa.
Phone BUtler 7-3158-59-8-3196

FOR SALE
To be removed by purchaser. All or part outside telephone plant. Approximately 439 miles.
FEDERATED TELEPHONE COOPERATIVE
CHOKIO, MINNESOTA

FOR SALE
2 POSITION AUTOMATIC ELECTRIC SWITCHBOARD 280 C.B. lines, 40 Lamp Signal Mag. lines, 10 toll lines, 15 Universal cords each position, including 24 V. battery, main frame, subcycle and test cabinet. Excellent condition (14 years old), now available, located at Wautoma, Wisconsin. Priced at $2,000. Offers requested.
also
2 POSITION KELLOGG MAGNETO SWITCHBOARD 250 lines, 15 cord circuits with repeating coils each position. Good condition, now available located at Whitehall, Wisconsin. Priced at $150.
Call 7995 or write Community Telephone Company of Wisconsin, Black River Falls, Wisconsin.

RECONDITIONED EQUIPMENT

W. E. 302 Desk type hand set. W/E1 - Head units, 3 Cond. Cords. @ $6.75 ea.
W. E. — E1 — Hand Units Only, 3 Cond. Cord. @ $3.00 ea.
Cons. Elect. Hand Units, 4 Cond. Cords, Capsule Receiver, & Transmitters. @ $4.00 ea.
SUboycle, Model M. 7.5-80 @ $25.00 ea.

Prices are F.O.B. Chicago

INDEPENDENT TELEPHONE REPAIR CO.
2137 West 21st St. Chicago 8, Ill.

STROMBERG-CARLSON RELAY CABINET containing:
10-Circuits-B40960 (Toll lline circuit)
18-Circuits-B40940 (Toll line circuit combination dial & ringdown)
15-Circuits-B41040 (Line circuit Toll Terminal)
STROMBERG-CARLSON RELAY CABINET containing:
30-Circuits-B46890 (Toll line circuit signal transfer)
6-Circuits-B48480 ((Trunk circuit Dial Tributary)
30-Circuits-B41040 (Line circuit Toll Terminal)
5-Circuits-B41080 (trunk circuit Inter Position)
TWO LEICH (VIBRATOR TYPE) HARMONIC RINGING CURRENT GENERATORS
reply: SEACOAST TELEPHONE CO., MYRTLE BEACH, S. C.

Reconditioned Stromberg-Carlson 1248 W Magneto desk sets Strong Alnico generator easily converted from magneto to common battery or dial operation. Shipped on approval.

Price .....$19.50 each
12 or more .....$18.50 each

BOHNSACK EQUIPMENT CO.
GERMANTOWN, NEW YORK

GOV'T SURPLUS

Brand New Conduit, 4 way, 3½" Clay Duct 36", 6000 Duct feet. 500 Pieces—cost to Government $8,880.00, we offer at fraction of original cost. Must be moved from Gov't. base immediately, make us your offer today.

CALL . . . WIRE . . . WRITE

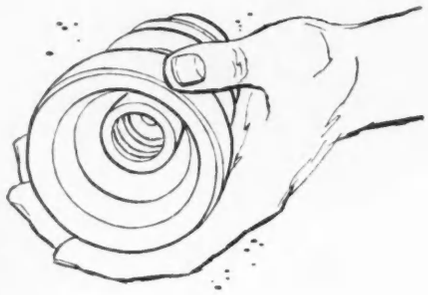
FULTON AUTO EXCHANGE,
2234 Stewart Ave., S. W.
Atlanta, Ga.
Phone: POPULAR 7-8606

WANTED TO BUY

Wanted to buy: 500 wall telephones (for cabinet use) complete with shelves, $50.00 per 100. Ronald Ramsey, Batavia, Iowa.

"Don't burn old phones, $50.00 per 100 phones. Mr. Ronald Ramsey, Box 206, Batavia, Iowa.

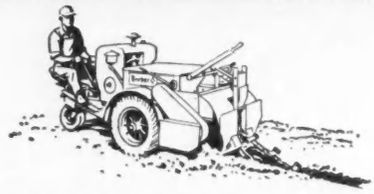
ACCURATE THREADS



You can count on Armstrong Glass Insulators to fit your mounting pins . . . exactly. Each insulator is hand-gauged for accuracy of threads as it comes off the production line. For details, write Armstrong Cork Co., 295 Fifth Avenue, New York 16, New York.

Armstrong GLASS INSULATORS
for communications . . . for power

NEW DITCHER



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UNDERGROUND CABLE

- Now you can place cable underground at low cost.
- The new answer for electric, signal or telephone cable.

Barber-Greene
model
702 DITCHER

See your B-G distributor or write

Barber-Greene B-G
AURORA, ILLINOIS

BARTLETT MFG. CO.

ROAD SIGNS

Automatic Type Tripod standard can be set up instantly. Will not blow over. Folds in a flash for compact carrying. Sturdy construction. 4 ft. Automatic Type (illustrated) has locking cam for tripod legs, and 18" x 18" metal sign.
Sample stock wordings:
"DANGER, MEN WORKING"
"DANGER, MEN WORKING IN TREES"
"MEN WORKING ABOVE"
Write for Catalog No. 36

NOW AVAILABLE

Bartlett tree paint for application to tree wounuds.
Also Pruning Saws.

TRADE MARK COMPOUND LEVER

BARTLETT MFG. CO.
3052 E. GRAND BLVD.
DETROIT 2, MICHIAN

Cyrus G. Hill Dies;

CYRUS G. HILL, 65, who founded a Chicago Consulting Engineering Firm which bears his name, died February 5, of a heart ailment. Mr. Hill was an active telephone engineer, and for more than 35 years served the Independent telephone industry.

In 1912, Mr. Hill graduated from Yale College and in 1914, he received his masters degree in electrical engineering from Harvard University. In addition he was awarded the Dettra prize for original work in mathematics.

In 1920 after serving two years with the Bell System and two years with Western Electric in Chicago, he formed a partnership with J. G. Wray to do consulting engineering work. In 1946 after Mr. Wray died, the company of Cyrus G. Hill Engineers was formed to continue consulting engineering work under his own name.

Mr. Hill was a member of the United States Independent Telephone Association. He was a life member of the American Institute of Electrical Engineers, a member of the Western Society of Engineers and of the American Mathematical Society.

He was a registered professional engineer in the states of Illinois, Wisconsin, Michigan and Alabama. He was also a member of Phi Beta Kappa and Sigma XI.

During 1917 and 1918, as a captain in the United States Air Force, he was in charge of communications and electrical installations at the large air bases near Tours and Bordeaux, France.

He is survived by his widow, Elizabeth Grey Hill, and three daughters, Mrs. Matthew J. Rockwell, Mrs. Joseph O'Neill Jr., and Miss Susan Hill.

Walter Rosenfeld Dies Served Leich 39 Years

WALTER C. ROSENFELD, 56, purchasing agent for Leich Electric Co., died February 9. He had been in ill health for several years, but until recently had remained active in his position.

Mr. Rosenfeld was well known and respected in telephone circles, having spent more than 39 years with the Leich organization.

His son, Lloyd, is an installer for the Leich Electric Co.

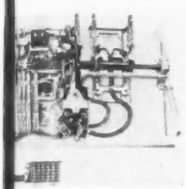
STROMBERG-CARLSON

Transmitter

A DIVISION OF GENERAL DYNAMICS CORPORATION

VOLUME 4, NUMBER 12 • MARCH, 1956

Atlantic Ocean, U.S.A. gets an XY Dial System



The world's smallest island telephone system was installed recently by the U. S. Air Force at the radar station called "Texas Towers." It is 110 miles to the nearest land (Cape Cod, Mass.) and 87 feet to the surface of the ocean (straight down).

Man-made island stands on three steel-and-concrete legs that have already proven their ability to withstand hurricane-velocity storms. In rough weather, island may sway as much as 18", according to engineers. Nickname "Texas Towers" comes from its resemblance to Texas offshore drilling rigs.

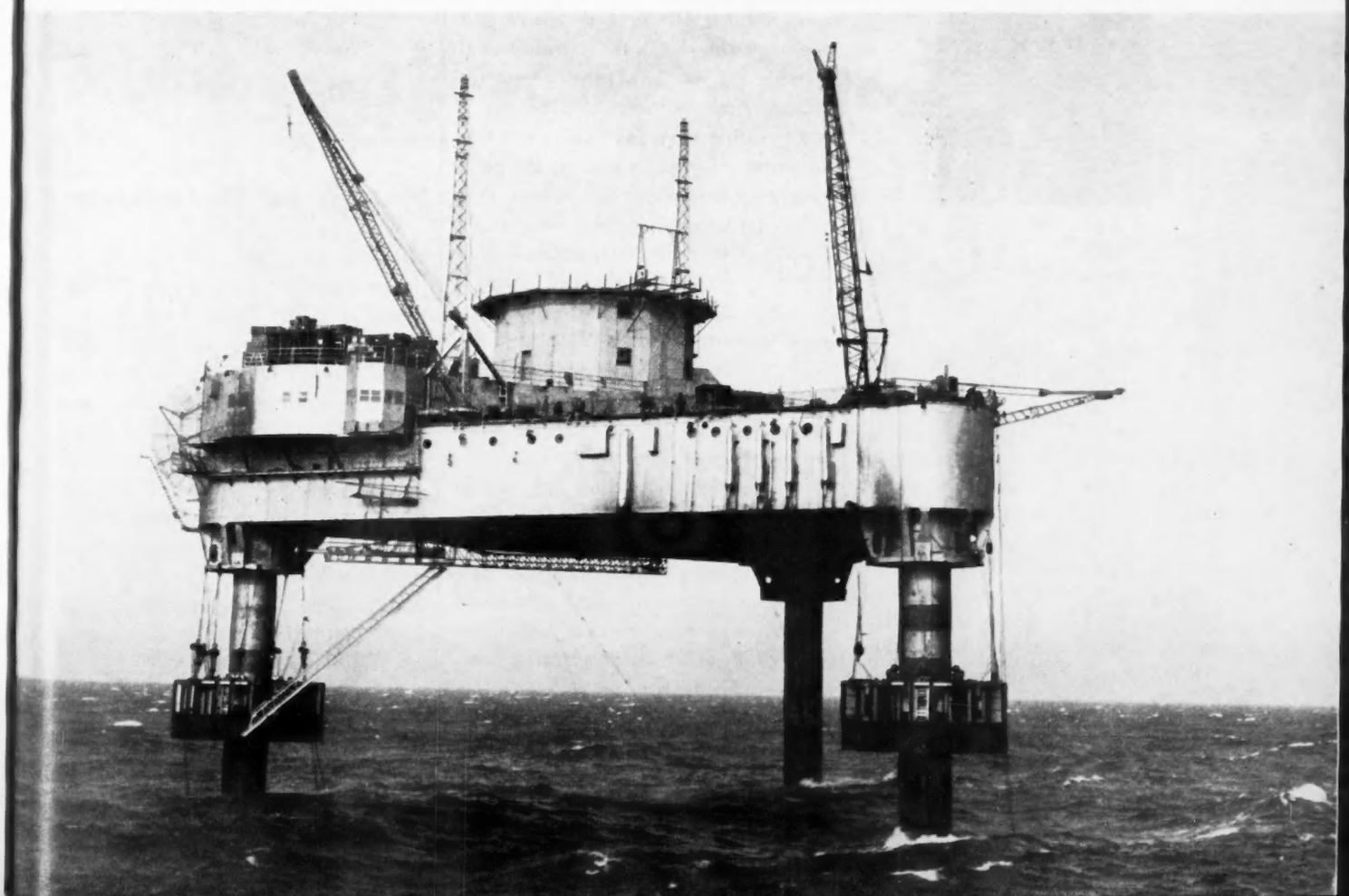
Like something from another world, it stands silently with its three concrete-filled feet deep in the ocean floor, its shoulders in the angry Atlantic Ocean and its alert radar ears probing the sea and sky in all directions.

At a cost of 20 million dollars, this weird steel tripod is bringing America ten minutes of extra warning time against air attack.

The Air Force men stationed at the tower work on 30-day shifts, the maximum time the Air Force considers a man can stand the monotony. The unbroken horizon of water, the gentle sway of the tower in high seas, and the steel deck for landing helicopters are all the "scenery" there is on "Texas" island, U.S.A.

The day's work is usually a quiet, routine watchdog chore. Yet the installation must be ready for feverish action at any time of the night or day.

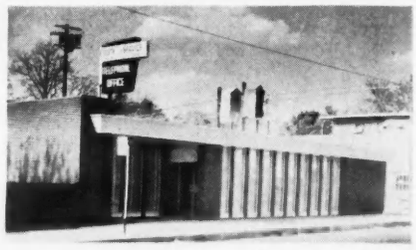
The reliability of XY® dial equipment plays its own role in the life of this silent sentinel . . . one part of a network that's providing extra protection for our country against the possibility of hostile attack.



and just for contrast . . .

This is Anywhere, U.S.A. - - - 1900

From a Page 1 present, which brings reassurance along with its frightening aspects, many will enjoy turning back the calendar to a calmer era, full of nostalgic memories. The photograph was loaned by Marchant Calculators, Inc., who—like the telephone companies—are crusading to rid the world of "cranks." That the telephone industry has been highly successful is acknowledged by Marchant, as they had to make a "studio set-up" for their photo. Independents can take a well-deserved bow for their part in bringing the best telephone service available today to all parts of the country.



New XY® dial office, Colusa

Colusa, California

The facing page dramatizes this story. Floods in California this winter brought cataclysmic disaster to thousands who were in the midst of joyous Christmas preparations. Right in the thick of this—rendering aid, maintaining the link with the outside world that was to mean life itself—were the men and women of the California Pacific Utilities Company, especially those in the Colusa office. They would abhor the word "heroism," but the comfort they brought by remaining at their posts without thought of relief should not go unacknowledged.

Meet Edgar R. Sears, Sr.

Manager, Industrial Sales

If Ed Sears' many friends wonder if he has dropped out of sight, his answer is both a "no" and a "yes." He has *not* left the telephone field, where he has spent all of his adult life, but he *is* buried in his new job as manager of Industrial Sales for Stromberg-Carlson . . . and loving it!

Edgar R. Sears, Sr. (and the "Senior" is important since his son, Ed Sears, Jr., is now a telephone sales representative for Stromberg-Carlson on the West Coast) grew up in the town of Hutchinson, Kans., and broke into the telephone business with the Southwestern Bell in 1918. After five years of valuable experience installing and repairing central office equipment he moved to Abilene, Kansas, and a more responsible job with the United Telephone Company.

In the course of his new duties, Ed conducted subscriber demonstrations of new equipment; in this he had the enthusiastic support of public relations-minded Milton Eisenhower and the somewhat more than professional interest of a newspaper reporter named Ruth — now Mrs. Sears.

Operating company experience was to prove of great value in the next chapter wherein Ed Sears became a sales representative and eventually Pacific Coast division manager for Kellogg Switchboard and Supply Company, prior to joining Stromberg-Carlson in June 1955.

The Industrial Sales department is already embarked on an ambitious program, with its own salesmen, sales engineers and manufacturing facilities. Rapidly increasing interest in components, both telephone type and specialized, for industrial applications; private communications systems; and electronic data processing equipment indicate that expansion will continue at an accelerated pace.

With his fingers on so many buttons, Ed has little time for outside activities, other than the all-absorbing interest in his children and their own growing families.

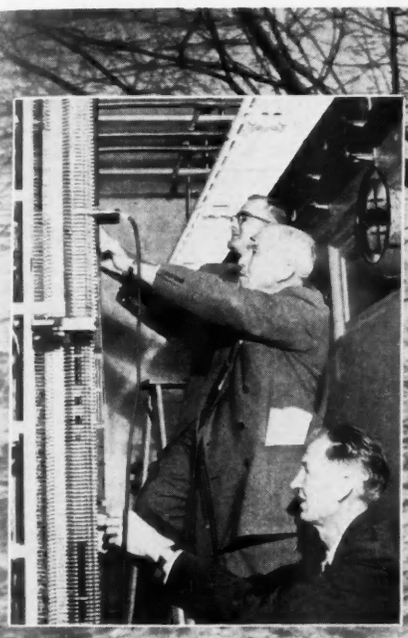
Salute fo[illegible]

Pine Grove, Pennsylvania

Less dramatic, perhaps, but equally in the telephone tradition is the way Lew and Ralph Hyle of the Lycoming Telephone Company—small operators by many standards—have quietly improved their system to the extent that it was selected over many larger companies for special recognition in excellent management. Such achievement brings encouragement to others whose size and problems are similar, and emphasizes that the strength of Independent Telephony today is the sum total of the progress made by each individual company.

Lew Hyle, of Pine Grove, Pa., in one of his XY dial exchanges.

W. W. Stahl (center), equipment engineer for California Pacific Utilities and Gayle Smith (nearest camera), district manager for the company cutting in the XY dial office at Colusa which became the center of the communications nerve system during floods.



CALIFORNIA-PACIFIC UTILITIES COMPANY
405 MONTGOMERY STREET
SAN FRANCISCO 4

YUKON 6-0400

January 17, 1956

Mr. G. B. Forbes, Editor Sales Publications,
Stromberg-Carlson Company
Rochester, 3, New York

Dear Mr. Forbes:

In answer to your letter of January 9th, I am pleased to attach a clipping of an unsolicited article which appeared in the Colusa paper December 28th, regarding the question of service during the recent California floods.

While we operate six exchanges, including Colusa, in the vicinity of the flooded area, we were fortunate in having very minor damage to our own plant. Colusa, however, was one of the principal points whereby evacuees from flooded cities were assembled, the County Fair Grounds being turned into a major relief center.

We were particularly fortunate in having both a new dial and toll installation, and we are pleased to state, that all equipment performed in a very satisfactory manner under abnormal, over-loaded conditions.

Very truly yours,

W. W. Stahl,
Telephone Engineer

WWS:b
cc: Mr. J. P. Galligan

fomeritorious service—California; Pennsylvania

AMERICAN INSTITUTE OF MANAGEMENT
Incorporated – A Non Profit Foundation
125 EAST 38TH STREET
NEW YORK 16, N.Y.
MURRAY HILL 3-2890

STATEMENT OF MANAGEMENT CONDITION

We have examined the management operations and accomplishments of

Lycoming Telephone Company

for the calendar year 1955 in accordance with the following ten functional areas of the Management Audit:

Economic Function	Directorate Analysis
Corporate Structure	Fiscal Policies
Health of Earnings	Production Efficiency
Fairness to Stockholders	Sales Vigor
Research and Development	Executive Evaluation

It is the opinion of the American Institute of Management that the operations of this Company have conformed with sound management standards in all ten categories.

We therefore place this management on the 1956 List of Excellent Managements, numbering 379 American and Canadian companies.

AMERICAN INSTITUTE OF MANAGEMENT

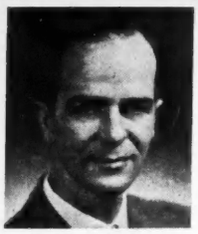
Jackson Martindell

Jackson Martindell, President

January 3, 1956

DIRECTORS: C. Canby Balderston, Dean of Wharton School, University of Pennsylvania — William C. De Vane, Dean of Yale College, Yale University — Alfons B. Landa, Partner, Davies, Richberg, Tydings, Beebe & Landa — Jackson Martindell, President A.I.M. — Wheeler Sammons, Publisher, Who's Who in America — Ordway Tead, Editor and Director, Harper & Brothers — Edward R. Weidlein, Director, Mellon Institute of Industrial Research

Lew Hyle (left) and brother Ralph shown inspecting one of the nine XY dial offices comprising the Lycoming Telephone Company system. These men have shown a genius for rehabilitation and sound principles of management in accomplishing so much from so little in so short a time.



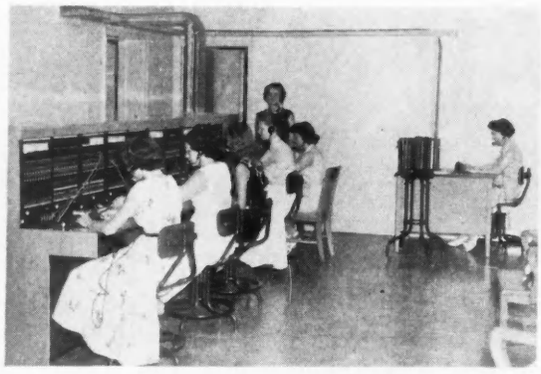
George Forbes

The Postman's Holiday: No. 7

Five-miles of tide-packed sand, one hundred yards wide and very few bathers at this hour. Two pairs of young eyes gleamed as I said, "Would you like to try the wheel for a few minutes?" This, of course, was Daytona Beach.

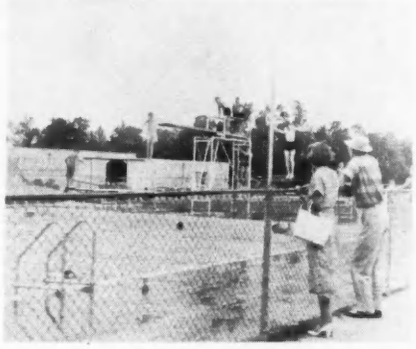
We'd had a wonderful swim the night before at New Smyrna and had a whole day of vacation as we drove north toward our next call. Marineland wraps up considerable novelty in a rather high-priced ticket; St. Augustine fattens on its past; one of the choicest strips of beach near Jacksonville has now been made available to the public — and thoroughly appreciated! Much too late, camp was pitched by lamplight at Fernandina State Park, and then the amazing discovery that the family in the next tent site were relatives! How we talked, while the children guzzled pop and pecans.

A side trip to the ancestral home at St. Mary's, Georgia; then inland through pine and tobacco to *Statesboro*. Charley Jo Mathews dropped the job of manager to become host and saw that we met all the girls in the business office as well as Mr. James Mathews whose experience goes back to the founding of the company. The business office has remained in the former exchange building because of its location on the public square.



Toll room at Statesboro, Ga. Miss Bernice Woodcock, chief operator, standing.

Charley Jo Mathews understands kids, took them to Statesboro pool. Happy landing, Fred!



But it was easy to see that Charley Jo was anxious to show us his beautiful new XY® MDO and toll center. Statesboro's city limits form a perfect circle 2 miles in diameter, with the new dial office located so as to minimize cabling. Bulging warehouses and colorful tobacco auctions in progress testified to its importance in the surrounding countryside. Keenly aware of the growth possibilities of the franchise area, Charley Jo and Ed Bibisi, his plant superintendent, have built a building and installed a system for the good future ahead.

That night our motel was one of a fleet of "grounded" house-trailers — novel to us, and creating quite a double-take when friends see kodachromes of our station wagon backed up to it. By mid-morning we were in the heart of watermelon country (5 for $1.00) and the newly-carved domain of Norman Spell at *Walterboro*, So. Carolina. His Palmetto Rural Telephone Coop. serves all the fringe area surrounding the city. As former manager of the R.E.A. Coop. which brought electricity to these same customers, Mr. Spell not only recognized the need of these people for service, but had his outside plant ready-built through joint use of poles.

In such a region of diversified agriculture, lumbering and pulpwood, people naturally spread out. It is con-

Feeding time at Marineland, between Daytona and St. Augustine.

Mr. and Mrs. C. J. Mathews and Charley's mother shown in Statesboro XY dial room.

Ancestral home at St. Mary's, Ga. Great-grandfather was medical officer in Confederate army.

Unloading tobacco for Statesboro auction.

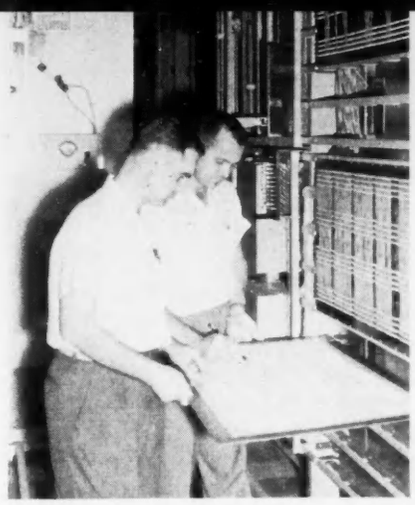
Principal exchange and business office of Palmetto Rural Telephone Cooperative at Walterboro, South Carolina.

ceivable that the subscribers served by the Coop. may some day outnumber those in the city exchange. Service is provided through five CDO's, each interconnected for free service, and providing toll and E.A.S. for all through Walterboro. This greatly reduces the length of individual subscriber lines and offers flexibility as service can be pushed out from several points.

If we hadn't been so excited about our next destination we would have stopped longer in Charleston — queenly city that has maintained her poise while quickening her tempo. *Myrtle Beach* was ahead — fabulous "beanstalk" community which sprang from plan to reality in a few short years, only to be prime target for the most destructive hurricane of this generation.

Bob White, manager of the Seacoast Telephone Company, and his wife Thelma, drove us up and down the beach. Signs of destruction were still evident, but beside every fragment of shattered foundation a new, larger, stronger home now stands. Far from beaten, the city now is bigger, cleaner, finer, and more and

Norman Spell (left), manager, and Howard DeVane, equipment supervisor, in Palmetto's dial room.



Standing by grading panel in Myrtle Beach XY dial office: Robert Dove, C. O. repairman and L. W. Lambert, test desk man.

more people who plan to stop for a night remain for a week or perhaps to live.

It wasn't easy to put telephone planning into overdrive when even the real-estate people were underestimating the size of the boom. Then the hurricane, to set schedules back even further. The Seacoast Company has come a long way, with large XY® offices in Georgetown, Myrtle Beach and Ocean Drive; immediate plans for service to a multi-million-dollar Air Force base, and an electronics plant with a $40,000 weekly payroll; and new hotels rivalling the $2,000,000 Ocean-Forest in splendor. But Bob White remembers the so-far unfilled applications (nearly 50% of his present 6,000 station count), gets up early in the morning, and prays that he'll be spared another hurricane.

This story must be continued — especially the helping hand extended by other companies in the hour of need. For now we have just time for a last swim with Bob and Thelma before heading inland.

D. B. "Bob" White and Mrs. Thelma White have "weathered" a herculean assignment in coping with the mushrooming telephone needs of Myrtle Beach and other exchanges of the Seacoast Telephone Company.

Tom Grady, commercial manager, and Mrs. Kathryn Corvette, cashier, count day's receipts from busy coin booths at Myrtle Beach.

Toll office at Myrtle Beach was one of first in southeast to go nationwide intertoll. Business is literally pushing out the walls.

Without the Beach, what would Myrtle be?

Development of the Ticket Cutter and Stacker for Stromberg-Carlson Toll Ticketing

by A. Wharton, Electro-Mechanical Engineering Section

In the Stromberg-Carlson Toll Ticketing System, a small but important component is the ticket cutter and stacker, which receives the continuous strip of printed paper from the automatic typewriter, cuts uniform size tickets, and stacks them into a neat pile ready for the Accounting Department. In developing and designing this device for commercial application, the Electro-Mechanical Engineering section ran into a number of interesting and challenging problems. Cutting and handling paper always presents special headaches. In addition, there were specific circuit requirements to be met.

Figure 1 shows the ticket cutter and stacker in its present form. A definite effort was made in the design to evolve a clean, functional appearance, in keeping with modern design and harmonizing with the stream-lined flexowriter to which it is attached. The ticket cutter is readily removable without tools, and all electrical connections are made with a single eight-point plug. All working parts are concealed under the streamlined housing, yet are readily accessible for lubrication or servicing.

The prototype model, built in the Stromberg-Carlson Research Department, demonstrated the feasibility of cutting uniform tickets from a continuous paper strip. This model also solved the problem of de-reeling the paper from the supply roll without over-running, by use of an ingenious automatic brake (see Figure 2).

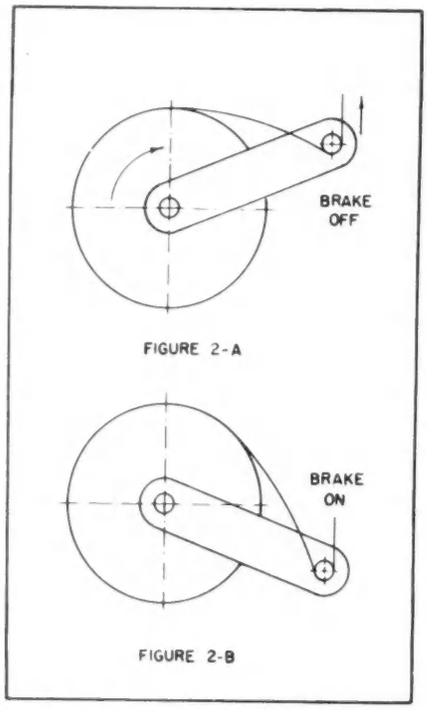
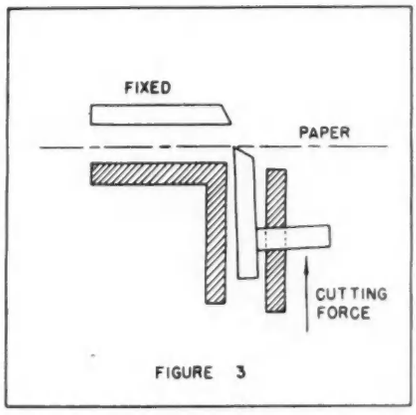


FIGURE TWO

The prototype model employed a hinged, spring-loaded cutting blade, driven by a rotary solonoid. New circuit requirements demanded a drastic reduction in the power required to drive the cutting blade. Before this problem was solved, an extensive experimental program had been carried out. Various types of blades (including Gillette Razor Blades!) were tested before a satisfactory solution was evolved. The design finally adopted employs a guillotine type blade moving upward past a stationary blade. These blades are made of clock spring steel, carefully ground flat and honed to an unbroken razor edge. Life tests indicate that they will cut over 500,000 tickets without sharpening.



The moving blade runs in loose-fitted guides with virtually no friction. The driving force is applied out of line with the blade (see Figure 3), thereby forcing the two cutting edges together during the stroke, and separating them during the return stroke. Cutting power is provided by a standard "X" magnet coil (XY® Universal Switch) with a modified armature.

It was found that the grade of paper could affect the performance of the ticket cutter. In order to insure uniform results, Stromberg-Carlson has written a rigid specification and established a source of supply for this paper. To take care of our customers, a stock of paper is maintained at Rochester, ready for regular orders, and emergencies. We do not advise the use of other papers, locally obtained, since we cannot predict their

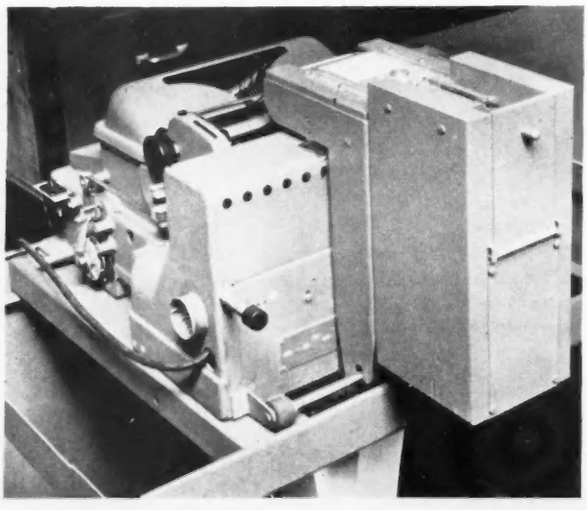


FIGURE ONE
General view of the cutter and stacker assembly used with printing equipment in Stromberg-Carlson Toll Ticketing System.

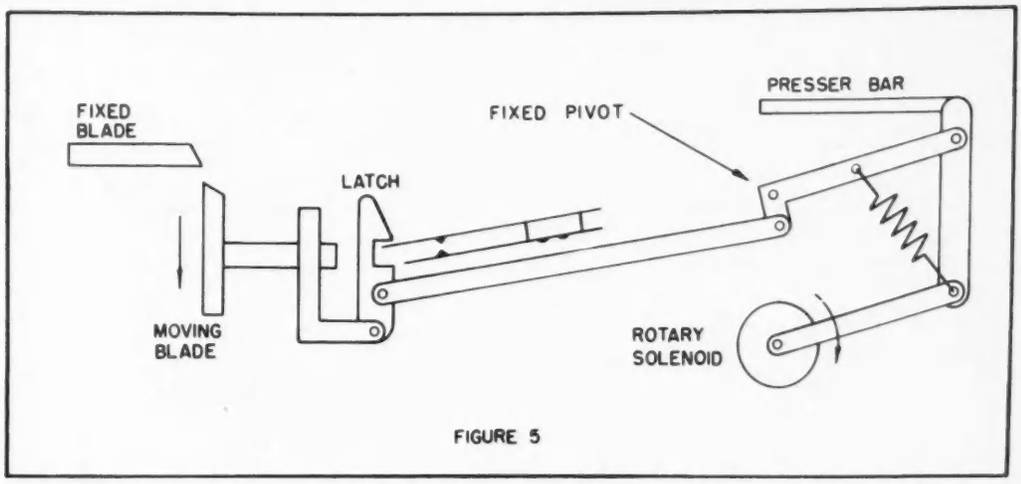


FIGURE 5

performance in the ticket cutter.

The continuously rotating wheel, used on the prototype model to eject the cut tickets was modified to obtain supervisory signals required by the circuits. This was accomplished by mounting the wheel on a swinging cradle, which would operate contacts. Referring to *Figure* 4, friction of the revolving wheel on the paper causes the cradle to move to the left, closing

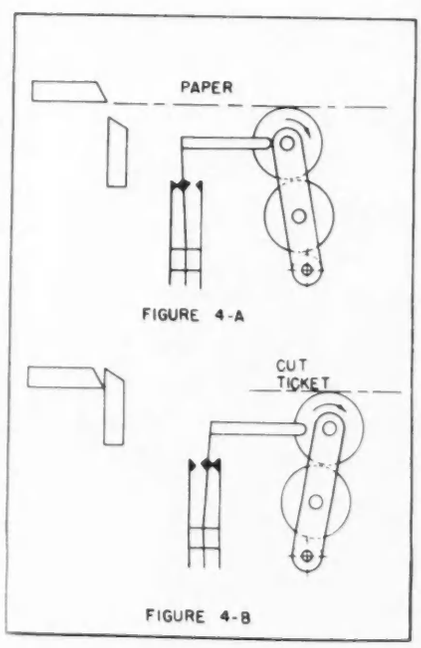


FIGURE 4-A

FIGURE 4-B

the normally open contacts. This signals the read-out equipment that a full-length ticket has reached the cutting position, and a "cut" impulse is sent through. Should a paper fail to feed properly, or the paper supply run out, no signal will be sent and the "read-out" equipment will register an "alarm."

In normal operation, the cutting blade severs the paper strip, and the cut ticket is rapidly ejected by the moving wheel. With the paper severed, there is no force to hold the cradle, and it returns to the normal position, closing the normally closed contacts. This sends another signal to the read-out equipment, clearing the circuit to start printing the next ticket.

Should the ticket fail to cut off, or otherwise fail to eject properly, no signal will be sent and the read-out circuit will indicate an "alarm." Thus, the ticket cutter provides built-in safe guards to assure proper sequence of operation, and to give warning in case of several different possible troubles.

The tickets have curvature which varies depending upon the size of the paper roll, and also upon atmospheric conditions. This introduces problems in controlling the ticket as it is being ejected and stacked. Under some peculiar atmospheric conditions, the moving belts in the typewriter generate static electricity which may cause the tickets to cling together, and stack improperly. After numerous experiments, it was decided to eject the tickets on edge-rails, and then forcibly press them into place in the stacker. This scheme overcame differences in ticket curvature, and minimized trouble from static.

The bar which presses the tickets down moves in parallel motion in a 4-bar linkage powered by a rotary solenoid. In order to allow sufficient time for the ejected ticket to reach the proper position, the solenoid is actuated after the cutting blade has cut the paper and returned to normal.

Referring to *Figure* 5, as the cutting blade returns to normal, the latch closes the contacts which energize the rotary solenoid. This swings the linkage arms clockwise, causing the presser bar to move downward. This action causes the link to move to the left. At the end of the stroke, the latch disengages from the contact spring, allowing the contacts to open. With the solenoid no longer energized, the tension spring restores the 4-bar linkage to normal, ready for the next cycle.

The stacker includes a spring-supported platform which holds the stack of tickets at the proper height for easy removal through the access door. The rate of the springs was carefully calibrated to match the weight of the stack of tickets, holding the top ticket at the proper level to insure good operation, regardless of curvature in the tickets.

Life tests were run to check potential sources of trouble; these have been corrected. Results obtained both in the laboratory and in field operation indicate reliable performance and long life for the service intended.

Development of this device was a cooperative effort, involving work and ideas of many individuals. Among those who contributed were Howard Gleason, Automation Research, who built the prototype; M. A. Clement, Toll Ticketing Circuit engineer, Richard Dever, Electro-Mechanical engineer and Joseph Silver, foreman,engineering Model Shop.

It was no waltz . . .

In 8 years, Missouri system grows from magneto to 100% XY Dial

They're waltzing today in Missouri, but eight years ago things were different at the Twin Lakes Telephone Company.

Malcolm Sherwood, an ex-Bell man with plenty of experience and ambition, bought the company on March 1, 1948, for a fraction of its present worth.

"After we had had time to get our feet on the ground," Sherwood says, "we realized we had to rebuild the entire system."

The company serves four Missouri communities: Branson, Hollister, Forsyth and Rockaway Beach. When the Sherwoods stepped in (Mrs. Sherwood is secretary of the company) these were all magneto exchanges.

While providing much-needed service on an emergency basis, the new owners began to set their sights on new XY® dial equipment, and other improvements.

Financing was the biggest hurdle. Banks were not interested, unless the company became a corporation and sold stock. The Sherwoods wanted to improve their service first, as a demonstration of good faith to their prospective stockholders.

To their rescue came the Stromberg-Carlson Credit Corp., which helped get the improvements under way at the same time the company was incorporating.

On October 16, the Branson-Hollister exchange was cut over to XY®. This 200-line office, serving some 700 subscribers, is planned to expand to 1600 stations with only minor alterations. It is the last of the three exchanges to be cut over, making the company 100% XY dial.

In addition, the outside plant has been completely rebuilt, using almost 8 million feet of wire and cable, and three new offices were constructed.

Looking back over his shoulder, president and manager Sherwood estimates that 65 percent of the entire Twin Lakes system is less than one year old.

He can be justly proud of the tremendous progress he has brought to his communities in eight brief years!

Mr. and Mrs. Malcolm Sherwood, and a colorful array of the new Stromberg-Carlson dial telephones they are offering to their subscribers.

Malcolm Sherwood and an assistant pull insulators at the MDF.

Wire chief Tom Newman (right) discusses new XY equipmnet with Stromberg-Carlson's Roegner Cushing.

Cutover visitors: Left, John Gault of the Buffalo (Mo.) Telephone Co., and Fred Cartwright of the Noel Telephone Co.

STROMBERG-CARLSON TRANSMITTER

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the BACK of the BOOK

By John G. Reynolds

Party for "Party Liners"

WHAT WITH all the grousing there is by telephone users about 10-party lines and the one person, or more, on every line who hogs the phone day and night, a Kirkland, Wash. lady came up with something new to solve the problem. Or so we note by the *East Side Journal* of that thriving community, which reports that instead of cussing out the other nine people on her party line, *Mrs. Gordon Leen* invited 'em all in for coffee, cake, and conversation—person to person.

The telephone company was so happy with the idea that its officers dug up a display of telephones ranging back to an old magneto crank type to go along as decorations for the party. The people themselves thought it was a fine idea, including a general consensus that anyone should be able to say about all they have to say on the telephone within a 10-minute period.

So, instead of inviting the guy or gal who won't give up the phone to step outside, maybe you ought to invite them all in. But no hair-pulling, please.

"Seeing Double"

SUPERVISOR Neil MacIntosh of the Croydon Telephone Exchange, Melbourne, Australia, is a guy who's always seeing double.

It all began 2½ years ago when two 19-year-old twins, Irene and Joan Duncombe, reported for duty.

A year later Ruth and Margaret MacLennan, 17, also joined the switchboard staff of 30.

Then just recently, supervisor MacIntosh got "the shock of my life" when two more sets of twins walked in.

Dianne and Margaret Richards, 14, and Denise and Pat Gibson, also 14, had been assigned to the exchange after finishing their training.

MacIntosh had double trouble at first sorting the girls out, but now is happy about the whole business.

Twins working together, he says, are wonderful.

"Temper Test"

ONE OF THE biggest adventures you can embark on in the capital of Argentina today is to make a telephone call! Our correspondent tells us — "You never know what you will get in Buenos Aires. It may be a wrong number, dead line, interminable busy signal or just a strange clicking. Sometimes you may even get the number you are dialing!"

Wacky happenings have plagued Buenos Aires' telephone system in the post-Peron era. Argentines are blowing their tops about it.

Things got so bad the newspaper *La Epoga* came out with a front-page editorial. The newspaper charged certain Peronista-appointed employes of the Government Telephone Company, which operates all telephone circuits in Argentina, might be to blame.

There has been no comment from the Communications Ministry. In all fairness it should be said much of the telephone equipment in Buenos Aires is antiquated.

Jackpot

AT LEAST ONE Las Vegas, Nev. visitor has sworn off slot machines. He tells it this way: "I played the slots for three hours — got nowhere. In fact, I finally lost $2.50."

A couple of days later, the man, quite a traveler, visited Salt Lake City. "I put a dime in a pay telephone and dialed information. When I hung up I got my dime back plus a nickle and 14 quarters.

"Better than the slots any day."

"Touche!"

THE FIVE-YEAR-OLD daughter of a rooming-house proprietor was punished by being made to eat her supper at a small table by herself in a corner of the dining-room. She was forbidden to speak to anyone and everyone conscientiously ignored her.

As they were about to begin the meal, the roomers heard the child say this blessing:

"Thank you, dear Lord, for preparing a table before me in the presence of mine enemies."

"Puzzler"

FRIEND of ours is still puzzled by something that happened to him the other early morning. At a party he decided to call up a friend and bid him join the fun. Apparently he dialed the wrong number. He apologized to the sleepy voice that answered . He tried again and got the same voice. "I'm terribly sorry," he said. "I dialed most carefully. I can't understand how I got the wrong number."

"Neither can I," said the sleepy voice. "You see, we have no phone."

Coffee Break

SARDONIC comment on "coffee break" which has become a recognized and expensive feature of business life, appeared recently in *Printer's Ink*:

"To all employes: *Due to increased competition and a keen desire to remain in business, we find it necessary to institute a new policy. Effective immediately we are asking that somewhere between starting time and quitting time and without fringing too much on the time usually devoted to lunch periods, coffee breaks, rest periods, story telling, ticket selling, golfing, auto racing, vacation planning, and the rehashing of yesterday's TV programs, that each employe endeavor to find some time that can be set aside and known as the 'work break.'* "

Track Down Trouble

Swiftly
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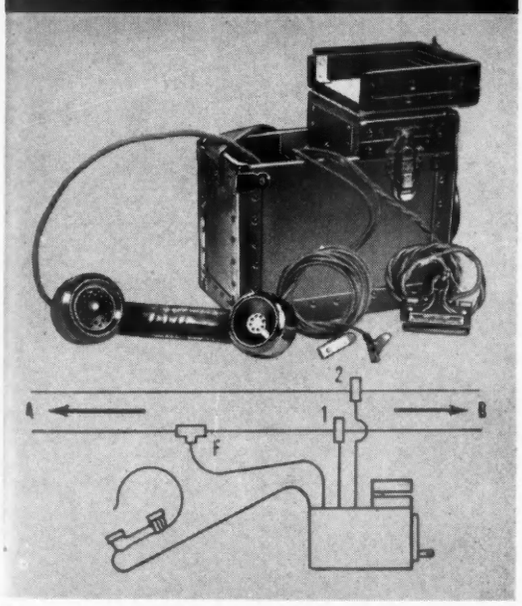

With clips #1 and #2 attached to line, your man clamps finder coil "F" on side "A". Tone indicates short in this direction. Lamp shows distance to trouble.

Swiftly—A few turns of the hand generator put a tone on the line which the finder coil picks up. Your man hears it with a handset. Volume of tone tells him direction of, and approximate distance, to the fault.

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